PRACTICAL Environmental Services, Inc.

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ENTERED

October 2, 2002

Mr. David Cobrain
State of New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Re: Supplemental Information for Giant Ciniza SWMUs

Dear Dave:

Thank you again for taking time to meet with me during my July 15th visit to your office. As promised, I have researched files at the NMED library, Bill Kingsley's office, and the Ciniza Refinery archive in order to obtain supplemental information for the various solid waste management units (SWMUs) located a the refinery. I have done my best to dig up everything that has been documented over that past 15 years since this investigation began, and I genuinely believe that all of the information that can reasonably be found, has now been uncovered.

I have organized this information in a sequential fashion according to the items in your letter of November 2, 2001. Some of the requested information is already available in the NMED library, and herein I provide a handy cross-reference. In addition, I have discovered that some key documents are not currently available in your library, and I am providing them as enclosures to this submittal. Last, some of the requested information (such as survey plats) is not available for all SWMUs and consequently we will have to generate this documentation for later submittal. Dorinda is planning to have new surveys conducted later this year.

It is my hope and belief that this supplemental information will be adequate to conclude the NFA assessment for most of these SWMUs. Please fell free to call me at (303) 759-5135 if you have any questions. I can also be available to meet with you again if necessary to complete this assignment.

Sincerely,

Thomas D. Atwood, P.E.

c: Dorinda Mancini, Giant Ciniza Refinery

Enclosures

Supplemental Information

In August 2001, Giant Refining Company submitted documentation to NMED regarding eleven SWMUs at the refinery and requested a "No Further Action" (NFA) determination. NMED staff subsequently reviewed this documentation and requested supplemental information in a letter dated November 2, 2001. This submittal provides the requested information in a sequential fashion that corresponds the items listed in the November 2, 2001 letter.

General Information

1. *Provide supporting data for the estimate of hydraulic conductivity.*

   I have located a 1981 Dames & Moore report that documents an extensive geotechnical investigation that was conducted at the site of the Land Treatment Unit (LTU). A copy of this report is enclosed in Appendix A. Table 1-A presents hydraulic conductivity, permeability, and soil moisture data for samples collected near the LTU. In addition, Precision Engineering Inc. (PEI) conducted a coefficient of permeability test on a soil sample collected during August of 2001. The results of this analysis are also included in Appendix A.

2. *Provide a general site-wide description of geologic and hydrologic conditions at the refinery.*

   The Ciniza Refinery is located on a layered geologic formation that slopes gradually from the southeast to the northwest. Surface soils consist of varied fluvial and alluvial deposits, clay, silt, sand, and locally obtained fill. Below the surface soil layer is the Chinle Formation, which consists of very low permeability clays and shales, and effectively serves as an aquiclude. Inter-bedded within the Chinle Formation is the Sonsela Sandstone layer, which represents the uppermost potential aquifer in the region. Groundwater flow within the Sonsela Aquifer follows the slope of the formation and is generally north by northwest. Shallow groundwater flows along the upper contour of the Chinle Formation. The prevailing flow direction is to the north; however, a subsurface ridge has been discovered and is thought to deflect some flow in a northeasterly direction in the vicinity of the refinery tank farm.

   In addition to this brief general description, a more detailed geo-hydrologic description can be found the above-mentioned 1981 Dames & Moore report located in Appendix A. In addition, PEI has prepared several descriptions and associated maps of the geologic and hydrologic setting. These descriptions and maps are also included in Appendix A.

3. *Provide the citation for the wastewater exemption for SWMUs #1, 2, and 12.*

   The applicable citation is 40 CFR 264.1 (g)(6), which states, "The requirements of this part do not apply to . . . a wastewater treatment unit as defined in 40 CFR 260.10." The definition of a wastewater treatment unit is "a device that is subject to regulation under 307(b) of the Clean Water Act, . . . receives and treats or stores an influent wastewater that is a hazardous waste, and . . . meets the definition of a tank or tank system." A tank is defined as "a stationary device, designed to contain an accumulation of hazardous waste which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support." A tank system is defined as "a hazardous waste storage or treatment tank and its associated ancillary equipment and containment system."

The aeration basins and the evaporation ponds are constructed of earthen dikes and do not meet the definition of a tank. The contact wastewater collection system is constructed of steel and concrete, and therefore is consistent with the definition of a tank and tank system.

4. *Provide copies of survey plats submitted to EPA prior to 1997.*

   In August 1994, Giant hired the surveying firm of Sterling & Mataya (Gallup, NM) to perform surveys of SWMUs #1, 3, 8, 9, and 13. Three survey drawings were produced. A copy of the transmittal letter and all three drawings are currently on-file at the NMED library. At this time, no additional surveys have been performed for the other SWMUs.

5. *Submit the results of the April 2001 groundwater monitoring and sampling event.*

   The requested report was submitted to NMED earlier this year.

SWMU #1 – Aeration Basins

This SWMU was initially investigated in 1991 during Phase II of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. In 1994, the EPA concurred in the NFA recommendation, but required Giant to begin a monitoring program aimed at assuring compliance on an ongoing basis. This program initially proposed collecting and analyzing soil samples every two years, but was later modified to a period of every five years. As such, additional soil sampling and analysis has been conducted as part of the ongoing monitoring program. The first monitoring activity was conducted in 1996, with a subsequent re-sampling activity performed in 1997. The purpose of the 1997 re-sampling activity was to corroborate certain analytical results from the 1996 monitoring activity.

1. *Provide a site plan showing the locations of all borings made post 1991.*

   The initial RFI process utilized a diagram of the aeration basin site in order to show the location of the soil borings. This original diagram was also used to show the location of the borings conducted as part of the monitoring program. Enclosed in Appendix B is the original diagram showing the location of the borings conducted in both 1996 and 1997. This information is also currently available in the NMED library and is contained in the 1996 and 1997 Quarterly Progress Reports.

2. *Provide the depths of the samples collected post 1991.*

   The 1996 monitoring activity consisted of six angled borings to a maximum length of 25 feet. Five discrete soil samples were collected from each borehole; one each at the 4 foot, 9 foot, 11 foot, 14 foot, and 21 foot intervals along the bore angle. All boreholes were angled so as to obtain samples from beneath the active zone of the aeration basins.

   The 1997 re-sampling activity consisted of two borings to a maximum depth of 5 feet. A single discrete soil sample was collected from each hole at a depth of 4 foot below ground surface. It should be noted that these re-sampling borings were conducted adjacent to the

two previous borings from the 1996 monitoring activity and were collected for the purpose of corroborating prior analytical data.

3. *Provide the dates and associated depths of samples collected post 1991.*

   Soil samples associated with the 1996 monitoring activity were collected on June 12 and 13, 1996. All samples from Borehole #1 were collected on June 12th and the remaining samples were collected on June 13th.

   Soil samples associated with the 1997 re-sampling activity were collected on February 18, 1997.

4. *Provide the laboratory analyses of the samples collected post 1991 and any data quality exceptions.*

   Enclosed in Appendix B are the laboratory analytical results for the 1996 monitoring activity and the 1997 re-sampling activity. The laboratory did not report any data quality exceptions in either set of analyses. This information is also currently available in the NMED library and is contained in the 1996 and 1997 Quarterly Progress Reports.

5. *Provide the boring logs for the samples collected post 1991.*

   Enclosed in Appendix B are the boring logs recorded by Precision Engineering for the drilling conducted as part of the 1996 monitoring activity and the 1997 re-sampling activity.

6. *Provide moisture content of soils adjacent to aeration ponds, if available.*

   None of the soil samples collected during either the initial RFI investigation or the subsequent monitoring activities have been analyzed for moisture content. This information is not available.

7. *Provide aeration basin influent and effluent sampling results.*

   Limited wastewater sampling and analysis is conducted routinely as part of the compliance activities associated with OCD Discharge Plan GW-032. Available data is enclosed in Appendix B and primarily consists of BOD, COD, TOC, and TDS parameters for water samples obtained at the aeration basin inlet and outlet.

Given the remote rural location of the refinery, the low hydraulic conductivity of the underlying soil, and the existing data indicating no significant impact to the subsurface, Giant believes that continuation of soil sampling and analysis for monitoring purposes is excessive and furthermore creates an unnecessary risk of breaching containment by continually drilling holes below the earthen floor of the basins. Giant currently monitors up-gradient and down-gradient shallow groundwater monitoring wells (e.g. SMW #4) in the general vicinity of this SWMU and believes that this program will provide adequate early warning of potential future contamination that may arise from the operation of the aeration basins.

Supplemental Information

SWMU #2 – Evaporation Ponds

This SWMU was also initially investigated in 1991 during Phase II of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. In 1994, the EPA concurred in the NFA recommendation, but required Giant to begin a monitoring program aimed at assuring compliance on an ongoing basis. This program initially proposed collecting and analyzing groundwater samples from nearby monitoring wells every two years, but this plan was later modified to a period of every five years. As such, groundwater sampling and analysis has been conducted as part of the monitoring program. The first monitoring activity was conducted in 1998 in conjunction with other routine OCD sampling and analysis.

1. *Provide a site plan showing the locations of all borings made post 1991.*

   No soil borings have been made subsequent to the initial 1991 investigation. However, groundwater samples from nearby monitoring wells have been collected and analyzed. These well locations are shown on the drawing enclosed in Appendix C.

2. *Provide the depths of the samples collected post 1991.*

   Not applicable. See above comment.

3. *Provide the dates and associated depths of samples collected post 1991.*

   Not applicable. See above comment.

4. *Provide the laboratory analyses of the samples collected post 1991 and any data quality exceptions.*

   Enclosed in Appendix C are the laboratory analytical results for the 1998 and earlier groundwater monitoring activities. The laboratory did not report any data quality exceptions.

5. *Provide moisture content of soils adjacent to evaporation ponds, if available.*

   Not applicable. See above comment.

6. *Provide evaporation basin influent sampling results.*

   The wastewater effluent from the aeration basins is the influent to the evaporation ponds. This data is enclosed in Appendix B.

Given the remote rural location of the refinery, the low hydraulic conductivity of the underlying soil, and the existing data indicating no significant impact to the subsurface, Giant believes that continuation of groundwater sampling and analysis for monitoring purposes should proceed under the jurisdiction and oversight of the OCD Discharge Plan. Giant believes that the OCD program will provide adequate early warning of potential future contamination that may arise from the operation of the evaporation ponds.

Supplemental Information

SWMU #3 – Empty Container Storage Area

This SWMU was initially investigated in 1992 during Phase III of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. In 1994, the EPA concurred in the NFA recommendation and requested a survey plat for the site. The survey plat was subsequently provided to EPA and a copy is on-file at the NMED library. During my research at the NMED library, I could not find a copy of this report in your file. Therefore, a copy of the RFI Phase III report, dated October 1992, is included in Appendix D.

1. *Provide information on heat exchanger additives to cooling water, if available.*

   The refinery ceased using chromium-based additives in 1992.

2. *Provide analytical data for heat exchanger bundle-cleaning sludge, if available.*

   No data is available. The bundle cleaning sludge is a listed hazardous waste and therefore must be disposed as such regardless of characterization analysis.

3. *Provide the year that the heat exchanger bundle-cleaning pad was installed.*

   The heat exchanger bundle-cleaning pad was constructed in 1997, at which time the empty container storage area ceased to exist.

Giant believes that the originally designated SWMU has been properly investigated and closed; and that NFA is an appropriate disposition for this site. The current heat exchanger bundle-cleaning pad is a concrete structure that incorporates a sealed drainage collection system and a connection to the refinery wastewater treatment system. As such, the heat exchanger bundle-cleaning pad meets the definition of a tank system and is exempt under 40 CFR 264.1 (g)(6).

SWMU #4 – Old Burn Pit

This SWMU was initially investigated in 1992 during Phase III of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. However, in 1994, the EPA did not concur in the NFA recommendation and instead requested additional soil sampling and analysis at greater depth. Three additional borings were then conducted later in 1994 and discrete soil samples were collected at the 6 foot and 10 foot depth below ground surface.

1. *Indicate whether soil samples were collected from the native soil located beneath the burn pit and provide analytical data.*

   Giant retained Precision Engineering of Las Cruces to conduct the soil borings for the 1994 supplemental investigation. I interviewed Bill Kingsley on Wednesday July 18th and he specifically recalls that all three borings were advanced into native soil before terminating the boreholes. Enclosed in Appendix E are the laboratory analytical result tables for the 1994 supplemental investigation. This information is also currently available in the NMED library and is contained in the document titled "Report on the Additional RFI Sampling" dated 10/1/94.

2. *Provide soil cap construction details.*

   A soil cap was installed over the site of the old burn pit during 1997. This activity was conducted in conjunction with the capping and closure of SWMU #5, the Landfill Areas. The same design and construction practices were used at both locations and substantially consisted of overlaying the site with successive layers of clean fill soil obtained from a borrow pit located in the north central section of the refinery property. Each layer was observed to be six to eight inches in thickness and then wetted and compacted to approximately 95 percent of standard Proctor Density. At SWMU #4 (old burn pit), this layering was continued until an overall depth in excess of three feet was obtained across the entire site. The finished surface was then crowned and contoured to prevent local ponding depressions and obtain gradual side-slope margins. Native manure and grass seed mix were then tilled into the surface to promote re-vegetation.

3. *Provide the locations and logs for all soil borings.*

   The initial RFI process utilized a diagram of the old burn pit site in order to show soil boring locations. During the 1994 supplemental investigation, a new diagram was created to show the location of these borings. Enclosed in Appendix E are the site diagrams showing the location of the borings conducted in both the 1992 and 1994 investigations. Also enclosed in Appendix E are the boring logs recorded by Precision Engineering for the drilling conducted as part of the 1994 supplemental investigation. This information is also currently available in the NMED library and is contained in the document titled "Report on the Additional RFI Sampling" dated 10/1/94.

4. *Provide drilling and sampling dates and depths of samples collected.*

   The 1994 supplemental investigation consisted of three borings to a maximum depth of 10 feet and collected two discrete soil samples from each borehole; one each at the 6 foot and 10 foot intervals below ground surface. These samples were collected on 7/29/94.

Giant believes that SWMU #4 (Old Burn Pit) has been properly investigated, capped, and closed; and that NFA is an appropriate disposition for this site. A survey plat for this site shall be developed and submitted to NMED.

SWMU #5 – Landfill Areas

This SWMU was initially investigated in 1992 during Phase III of the RFI. A report was issued in which it was recommended that a soil cap be installed over the site as part of a voluntary corrective action plan. In 1994, the EPA concurred in the corrective action remedy, but first requested additional soil sampling and analysis at greater depth in order to establish the vertical extent of contamination. Seven additional borings were then conducted later in 1994 and discrete soil samples were collected at the 11 foot, 16 foot, and 20 foot depth below ground surface.

Supplemental Information

1. *Provide locations and logs for the 9.5 foot borings (original 1992 investigation).*

   The initial RFI process utilized a diagram of the landfill areas site in order to show soil boring locations. Enclosed in Appendix F is the site diagram showing the location of the borings conducted in the original 1992 RFI investigation of SWMU #5. Also enclosed in Appendix F are the boring logs recorded as part of that investigation.

2. *Provide dates of drilling and soil sampling (original 1992 investigation).*

   The original 1992 RFI investigation consisted of twelve borings to a maximum depth of 10 feet and collected four discrete soil samples from each borehole; one each at the surface, 3 foot, 7 foot, and 9.5 foot intervals below ground surface. These samples were collected on 5/13/92 and 5/14/92.

3. *Provide locations and logs for the 20 foot borings (1994 supplemental investigation).*

   Enclosed in Appendix F is the site diagram showing the location of the borings conducted in 1994. Also enclosed in Appendix F are the boring logs recorded by Precision Engineering for the drilling conducted as part of the 1994 supplemental investigation of SWMU #5. This information is also currently available in the NMED library and is contained in the document titled "Report on the Additional RFI Sampling" dated 10/1/94.

4. *Provide dates of drilling and soil sampling (1994 supplemental investigation)..*

   The 1994 supplemental investigation consisted of seven borings to a maximum depth of 20 feet and collected three discrete soil samples from each borehole; one each at the 11 foot, 16 foot, and 20 foot intervals below ground surface. These samples were collected on 7/28/94.

5. *Provide soil field screening and analytical data for the 20 foot borings (1994 supplemental investigation).*

   This information is currently available in the NMED library and is contained in the document titled "Report on the Additional RFI Sampling" dated 10/1/94.

Giant believes that SWMU #5 (landfill areas) has been properly investigated, capped, and closed; and that NFA is an appropriate disposition for this site. A survey plat for this site shall be developed and submitted to NMED.

SWMU #7 – Fire Training Area

This SWMU was initially investigated in 1992 during Phase III of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. However, in 1994, the EPA did not concur in the NFA recommendation and instead requested additional soil sampling and analysis at greater depth. Two additional borings (angled under a fire training tank) were

then conducted later in 1994 and discrete soil samples were collected at the 7 foot and 11 foot depth below ground surface.

1. *Provide the sampling locations and summary of soil removal and sample collection activities performed as part of the 1999 soil remediation event.*

   During 1999, Giant dismantled the old fire training facility and replaced it with a new state-of-the-art fire training facility in which all equipment is now located on a concrete pad that incorporates an integral containment curb. Prior to installing the new facility, Giant removed and remediated up to 4 feet of surface soil in this area. In order to confirm that the excavation had proceeded to an adequate depth in order to obtain a clean soil margin, three boundary samples were collected from the bottom of the excavation zone. A diagram showing the location of these samples is enclosed in Appendix G.

2. *Provide a site plan showing the fire training area and soil sample locations.*

   This diagram is included in Appendix G.

3. *Indicate whether the 1999 samples were collected for confirmation purposes at the time of the contaminated soil removal.*

   Yes, these soil samples were collected in order to demonstrate that a clean margin had been obtained at the bottom of the excavation zone.

Giant believes that SWMU #7 (fire training area) has been properly investigated, cleaned up, and renovated as a new state-of-the-art fire training facility; and that NFA is an appropriate disposition for this site. A survey plat for this site shall be developed and submitted to NMED.

SWMU #9 – Drainage Ditch & Inactive Land Treatment Area

This SWMU was initially investigated in 1990 during Phase I of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact.

1. *Provide a site plan showing the boring and sampling locations from the original 1990 investigation.*

   The initial RFI process utilized a diagram of the drainage ditch and inactive land treatment area site in order to show soil boring locations. Enclosed in Appendix H is the site diagram showing the location of the borings conducted during the original 1990 RFI investigation of SWMU #9. This information is also currently available in the NMED library and is contained on page 2.10 of the document titled "RFI Phase I Final Report" dated 4/8/91.

2. *Provide the boring logs, sampling dates, and laboratory analyses for the original 1990 investigation.*

Also enclosed in Appendix H are the boring logs from the original 1990 investigation. This information is also currently available in the NMED library and is contained on pages 8.18 through 8.37 of the document titled "RFI Phase I Final Report" dated 4/8/91.

Given the remote rural location of the refinery, the low hydraulic conductivity of the underlying soil, and the existing data indicating no significant impact to the subsurface, Giant believes that that NFA is an appropriate disposition for this site. A survey plat for SWMU #9 was prepared in 1994. A copy of this plat is currently on-file at the NMED library.

SWMU #10 – Sludge Pits

This SWMU was initially investigated in 1990 during Phase I of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. However, in 1994, the EPA did not concur in the NFA recommendation and instead requested additional soil sampling and analysis at greater depth. Eight additional borings were then conducted later in 1994 and discrete soil samples were collected at the 19 foot and 25 foot depth below ground surface. Data from the supplemental investigation indicated that minor hydrocarbon contamination might still be present in at subsurface layer of the west sludge pit.

1. *Provide the depth of the sludge pits and the estimated maximum depth of excavation or removal by vacuuming for the 1980 removal operations.*

   The 1980 removal operation took placed when Shell Oil Company owned the refinery. I researched the refinery archives and could find no information indicating the original depth of the pits or the extent of sludge removal that was performed. In 1980, landfarming was a common treatment practice for API separator sludge and RCRA had only just been enacted. My guess is that the refinery personnel conducting this operation used work practices that were typical of the 1980 era and were not as rigorous as what we would see today. The data suggest that a minor amount of residual sludge was probably still present at the base of the pit after the removal operation. This contaminated soil zone, if present, would then have been exposed to the atmosphere until the 1990's, when the pits were filled with clean soil and capped. It can be reasonably assumed that most of the VOC constituents would have evaporated during this 10 year period and much of the semi-volatile hydrocarbons would have naturally biodegraded.

2. *Provide drilling dates and boring logs for both the original 1990 RFI investigation and the 1994 supplemental investigation.*

   Enclosed in Appendix I are the boring logs and associated drilling dates for both the 1990 and 1994 investigations. The 1990 and 1994 information is also currently available in the NMED library and is contained in the documents titled "RFI Phase I Final Report" dated 4/8/91 and "Report on the Additional RFI Sampling" dated 10/1/94, respectively.

3. *Provide a site plan showing the location of the borings for both the original 1990 RFI investigation and the 1994 supplemental investigation.*

   The initial RFI process utilized a diagram of the sludge pits site in order to show soil boring locations. This original diagram was also used to show the location of the borings conducted as part of the 1994 supplemental investigation. Enclosed in Appendix I are the site diagrams showing the location of the borings conducted in 1990 and 1994.

4. *Provide the depth interval of the residual contamination layer.*

   That data suggest that a minor residual contamination layer may exist at approximately 20 feet below the current ground surface.

5. *Provide sampling locations, dates, depths, and laboratory analytical results for both the original 1990 RFI investigation and the 1994 supplemental investigation.*

   Enclosed in Appendix I are the locations, dates, and depths for both the 1994 investigations. The 1990 and 1994 information is also currently available in the NMED library and is contained in the documents titled "RFI Phase I Final Report" dated 4/8/91 and "Report on the Additional RFI Sampling" dated 10/1/94, respectively. Drilling dates are 7/26/94 and 7/27/94.

6. *Provide additional information on sample collection methods as related to VOC analysis.*

   The only information available is that which is contained in the documentation for the original RFI work plan, the Generic Sampling Plan (Section 3.4, Soil Sampling Techniques), and the "Report on the Additional RFI Sampling" dated 10/1/94. This information is contradictory in that the Generic Sampling Plan describes a procedure for immediate transfer of the soil sample from the collection device directly into the laboratory container. However, the "Report on the Additional RFI Sampling" indicates that soil samples may have been placed within a stainless steel bowl as an intermediate step.

Giant believes that SWMU #10 (sludge pits area) has been satisfactorily investigated, cleaned up, capped, and closed; and that NFA is an appropriate disposition for this site. A survey plat for this site shall be developed and submitted to NMED.

SWMU #11 Secondary Oil Skimmer

This SWMU was initially investigated in 1992 during Phase III of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. However, in 1994, the EPA did not concur in the NFA recommendation and instead requested additional soil sampling and analysis at greater depth. Two additional borings were then conducted later in 1994 and discrete soil samples were collected at the 6 foot and 10 foot depth below ground surface.

Supplemental Information

1. *Provide a site plan showing the limits of the remedial excavation and the dates of soil excavation.*

   To be provided.

2. *Provide the depth of the remedial excavation and the estimated volume of the contaminated soil removed.*

   To be provided.

3. *Provide a dated site plan showing the location of the borings for both the original 1992 RFI investigation and the 1994 supplemental investigation.*

   The initial RFI process utilized a diagram of the secondary oil skimmer site in order to show soil boring locations. This original diagram was also used to show the location of the borings conducted as part of the 1994 supplemental investigation.

4. *Provide the boring logs both the original 1992 RFI investigation and the 1994 supplemental investigation.*

   Enclosed in Appendix J are the boring logs and associated drilling dates for both the 1994 investigations.

5. *Provide the laboratory analytical results for the 1994 supplemental investigation.*

   This information is available in the NMED library and is contained in the documents titled "Report on the Additional RFI Sampling" dated 10/1/94.

6. *If remedial action details are not available, determine if contaminants are present in the surface soils.*

   Not applicable. Remedial action has already been performed and contaminated has been removed and treated.

Giant believes that SWMU #11 (secondary oil skimmer) has been satisfactorily investigated, cleaned up, capped, and closed; and that NFA is an appropriate disposition for this site. A survey plat for this site shall be developed and submitted to NMED.

SWMU #12 – Contact Wastewater Collection System (CWWCS)

This SWMU was initially investigated in 1990 during Phase I of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. In 1994, the EPA requested that Giant perform a video inspection of the system every five years.

1. *Provide a copy of the CWWCS investigation work plan submitted to OCD.*

To be provided.

2. *Provide copies of all CWWCS investigation reports submitted to OCD.*

   To be provided.

3. *Provide a copy of the current OCD discharge plan.*

   To be provided.

Giant believes that this SWMU has been properly investigated and that NFA is an appropriate disposition for this site. The CWWCS is a network of steel and concrete piping and structures that forms the drainage collection system and a connection to the refinery wastewater treatment system. As such, the CWWCS meets the definition of a tank system and is exempt under 40 CFR 264.1 (g)(6).

SWMU #13 – Drainage Ditch Between the API Separator and the Evaporation Ponds

This SWMU was initially investigated in 1991 during Phase II of the RFI. A report was issued in which NFA was recommended based on a finding of no significant impact. In 1994, the EPA concurred in the NFA recommendation, but required Giant to begin a monitoring program aimed at assuring compliance on an ongoing basis. This program initially proposed collecting and analyzing soil samples every two years, but was later modified to a period of every five years. As such, additional soil sampling and analysis has been conducted as part of the monitoring program. The first monitoring activity was conducted in 1996. Three angled borings were conducted and discrete soil samples were collected at the 6 foot interval along the angle.

1. *Provide a site plan showing the location and features of this SWMU.*

   An updated site plan is enclosed in Appendix L.

2. *Provide the background and current information on the influent and effluent to this SWMU.*

   During the 1980's, a neutralization tank was operated in the vicinity of this drainage ditch. Neutralized wastewater from this tank was occasionally released to the ditch. This procedure was discontinued in the 1980's and tank was dismantled and removed. Subsequently, the only flow influent to the ditch has been wastewater from Evaporation Pond No. 10.

3. *Provide laboratory analysis of water samples from the ditch, if available.*

   No wastewater samples from this drainage ditch have been collected or analyzed.

4. *If bottom sludge or sediment samples were ever collected and analyzed, provide laboratory analyses results.*

   No bottom sludge or sediment samples from this drainage ditch have been collected or analyzed.

5. *Provide the boring logs for the samples collected during the initial 1991 RFI investigation and the 1996 supplemental investigation.*

   Enclosed in Appendix L are the boring logs from the initial 1991 RFI investigation and also the boring logs from the 1996 monitoring activity.

6. *Provide the depths of the soil samples collected in the 1996 supplemental investigation.*

   The soil samples were collected from angled boreholes at the 6 foot interval along the angle.

Given the remote rural location of the refinery, the low hydraulic conductivity of the underlying soil, and the existing data indicating no significant impact to the subsurface, Giant believes that continuation of soil sampling and analysis for monitoring purposes is excessive. Giant currently monitors up-gradient and down-gradient shallow groundwater monitoring wells in the vicinity of this SWMU and believes that this program will provide adequate early warning of potential future contamination that may arise from the operation of the aeration basins.

PRECISION ENGINEERING, INC.
P. O. BOX 422, LAS CRUCES,
NEW MEXICO 88004
505-523-7674

COEFFICIENT OF PERMEABILITY
FALLING HEAD

ATTN: MR. THOMAS D. ATWOOD, P.E.
PRACTICAL ENVIRONMENTAL SERVICES, INC.
2020 S. ONEIDA ST., STE. 200
DENVER, CO 80224

PROJECT: Ciniza R-O Water Infiltration Disposal Area

FILE NO.: 01-117

DATE OF REPORT: AUGUST 12, 2001

SAMPLE LOCATION: 01-117 B-2 WEST BORING

LAB NO.: 40168

TEST SPECIMEN CONDITIONS AT BEGINNING OF TEST:
WET UNIT WEIGHT: 141.3 PCF % MOISTURE: 8.3
DRY UNIT WEIGHT: 130.5 PCF % COMPACTION: UNDISTURBED

PROCTOR INFORMATION:
MAXIMUM DRY DENSITY:
OPTIMUM MOISTURE CONTENT:

COEFFICIENT OF PERMEABILITY (cm/sec.): $k_{20} = 5.1 \times 10^{-9}$

Remarks:

Reviewed By: Reviewed By: Certified By:

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER ASTM D-5084

PROJECT: Cinizo FILE NO.: 01-117
TESTED BY: G. DATE: 9-12-01 LAB NO: 401168

SAMPLE DIMENSIONS

SOIL TYPE:
WT. OF SAMPLE: 178.40
UNIT WT.: 141.3

DIAM.: 2.50 in
AREA: 4.909 in²
HEIGHT: .98 in
VOLUME: 4.81 in³
E

MOISTURE CONTENT
INITIAL
CAN NO.
CAN + WET SOIL
CAN + DRY SOIL
CAN WEIGHT
% MOISTURE

FINAL
CAN NO.
CAN + WET SOIL
CAN + DRY SOIL
CAN WEIGHT
% MOISTURE

TEST NO.	hp1	hp2	ha1	START TIME	END TIME	TOTAL TIME
1	28.0	[illegible]	.8	11:20 9-12	[illegible]	
2	28.0	[illegible]	.8	2:20 9-12	4:50 9-12	
3	28.0	20.7	.8	7:30 9-13	10:30 9-13	

WET UNIT WEIGHT 141.3
DRY UNIT WEIGHT 130.5
% MOISTURE 8.3
HYD. COND. 5.1×10^{-9}

% REQUIRED: —
% OBTAINED: —
PROCTOR VALUE: —
H_2O TEMP.: 23.9°C

NOTES: 01-117 B-2 West Boring

~~6.35×10^{-9}~~
4.91×10^{-9}
5.34×10^{-9}

THIS CALCULATES THE PERMEABILITY OF A SOIL USING THE FLEXIBLE WALL PERMEAMETER, FALLING HEAD METHOD

PARAMETERS Lab#: 38647 boring 9, 15.0-16.0

H_{p1} - initial reading of the pipet (small tube) at the beginning of the test
H_{a1} - initial reading of the annulus tube (large tube) at the beginning of the test
H_{p2} - final reading of the pipet (small tube) at the end of the test
H_{a2} - final reading of the pipet (small tube) at the end of the test
t_1 - initial time (beginning of the test)
t_2 - final time (end of the test)
T_w - Temperature of the water (^oC)

Enter the Temperature (T_w)= 13 C
Enter H_{p1} = 28 cm
Enter H_{a1} = .80 cm
Enter H_{p2} = 2.80 cm
Enter H_{a2} = cm

If you know the total test time in seconds-**Enter Here:** (leave it blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS.TH AM/PM**
Date entry format is **MO/DA/YR**

Enter t_1 time =10:57 AM
Enter t_1 date =2/16/99

Enter t_2 time =2:06 PM
Enter t_2 date =2/16/99

The elapsed test time in seconds is: 11340 <-Do not unprotect this

Enter sample length (L): 1.00 in
Enter sample Diameter (D): 2.50 in
The sample length is: 2.54 cm
The sample Area is: 31.67 cm^2

Density of Mercury at (T) is: 13.5634
Density of Water at (T) is: .99940
Viscosity Correction of Water (R_T): 1.197
Hydraulic Conductivity (k_{20})= 6.78E-8 cm/sec

THIS CALCULATES THE PERMEABILITY OF A SOIL USING THE FLEXIBLE WALL PERMEAMETER, FALLING HEAD METHOD

PARAMETERS Lab#: 38650 boring 10, 2.5-4.0

H_{p1} - initial reading of the pipet (small tube) at the beginning of the test
H_{a1} - initial reading of the annulus tube (large tube) at the beginning of the test
H_{p2} - final reading of the pipet (small tube) at the end of the test
H_{a2} - final reading of the pipet (small tube) at the end of the test
t_1 - initial time (beginning of the test)
t_2 - final time (end of the test)
T_w - Temperature of the water (^oC)

Enter the Temperature (T_w)= 13 C
Enter H_{p1} = 28 cm
Enter H_{a1} = .80 cm
Enter H_{p2} = 2.20 cm
Enter H_{a2} = cm

If you know the total test time in seconds-**Enter Here:** (leave it blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS.TH AM/PM**
Date entry format is **MO/DA/YR**

Enter t_1 time =9:49
Enter t_1 date =2/17/00

Enter t_2 time =3:35 PM
Enter t_2 date =2/17/00

The elapsed test time in seconds is: 20760 <-Do not unprotect this

Enter sample length (L): 1.00 in
Enter sample Diameter (D): 2.50 in
The sample length is: 2.54 cm
The sample Area is: 31.67 cm^2

Density of Mercury at (T) is: 13.5634
Density of Water at (T) is: .99940
Viscosity Correction of Water (R_T): 1.197
Hydraulic Conductivity (k_{20})= 4.86E-8 cm/sec

THIS CALCULATES THE PERMEABILITY OF A SOIL USING THE FLEXIBLE WALL PERMEAMETER, FALLING HEAD METHOD

PARAMETERS Lab #: 38652 boring 10, 6.0-6.5

H_{p1} - initial reading of the pipet (small tube) at the beginning of the test
H_{a1} - initial reading of the annulus tube (large tube) at the beginning of the test
H_{p2} - final reading of the pipet (small tube) at the end of the test
H_{a2} - final reading of the pipet (small tube) at the end of the test
t_1 - initial time (beginning of the test)
t_2 - final time (end of the test)
T_w - Temperature of the water (^oC)

Enter the Temperature (T_w) = 14 C
Enter H_{p1} = 28 cm
Enter H_{a1} = .80 cm
Enter H_{p2} = 1.90 cm
Enter H_{a2} = cm

If you know the total test time in seconds-**Enter Here:** (leave it blank if you don't)
Otherwise:
Time entry format is **HH:MM:SS.TH AM/PM**
Date entry format is **MO/DA/YR**

Enter t_1 time =8:14 AM
Enter t_1 date =2/19/00

Enter t_2 time =8:15 AM
Enter t_2 date =2/20/00

The elapsed test time in seconds is: 86460 <-Do not unprotect this

Enter sample length (L): 1.00 in
Enter sample Diameter (D): 2.50 in
The sample length is: 2.54 cm
The sample Area is: 31.67 cm^2

Density of Mercury at (T) is: 13.5610
Density of Water at (T) is: .99927
Viscosity Correction of Water (R_T): 1.165
Hydraulic Conductivity (k_{20})= 1.76E-8 cm/sec

Giant Refining Company – Ciniza Refinery
Geologic Setting

The Ciniza Refinery is located in Central Western New Mexico immediately adjacent to Interstate 10 in the New Mexico Structural Unit known as the Zuni Uplift. The site is situated on the northwestern limb of the uplift. Generally, the formation rocks below the site dip to the north-northwest at 2-3 degrees. Some rocks on the south side of Interstate 10 dip as steeply as 4 degrees. The major rock unit at the site is the Chinle formation.

The site encompasses approximately two square miles. At the extreme southern portion of the site, rocks of the Chinle Formation are exposed at the surface. At the northern edge of the property the rocks of the Chinle Formation are buried in soils as deep as ninety (90) feet.

The general topography of the site is controlled by the dip slope of the Chinle Formation. The refinery facility itself is situated on an erosional limb of the Chinle Formation that is capped by coarse grained materials deposited as a result of alluviation of pebble conglomerates and shales located in the highlands to the south. Just north of the refinery facility the property drops abruptly to a relatively level plain formed by older flood deposition of the Rio Puerco. The soils of the low, flat fluvial deposits are fine grained materials deposited as a result of weathering of the Chinle mudstones and siltstones.

The oldest rocks of significance below the site are at a depth on the order of 800 feet. These rocks are limestones and shales of the San Andreas and Yeso Formations. These rocks form the primary aquifer in the area and produce all the water that is used at the refinery. The major unit overlying these rocks are the siltstones and mudstones of the Petrified Forest Member of the Chinle Formation. The Chinle produces no water with the exception of one sandstone bed located near the surface at the site. This bed is a named bed within the Chinle known as the Sonsela Sandstone. The bed does not have formation designation but is potentially a minor aquifer and is therefore significant to the site. Water derived from the Sonsela at the site is not potable because of its high salinity, however, there are a few wells drawing water from this bed that is used for livestock some distance to the east.

South of the interstate highway the Sonsela is exposed at the surface where water is locally recharged. At the refinery site the bed is from 30 to 120 feet below the surface and is overlain by impervious shales. The shales cause the water from the Sonsela to be confined and therefore artesian, however, there is only one well monitoring water in the Sonsela on the site that is known to flow water to the surface.

The mudstones and siltstones that make up the shales of the Chinle overly the Sonsela across the entire developed area of the refinery property. These shales are highly montmorillonitic and provide an effective seal against water migration either from the confined potential aquifer of the Sonsela or into the Sonsela from the surface. Directly overlying the shales is the gravelly alluvial deposits discussed previously. At many locations on the site there is some water present in these gravels. The water is prevented from migrating downward by the shale. Where present, the water has never been observed to penetrate the shales more than four (4) to six (6) inches

The alluvial outwash is present in all borings at the site with the exception of a few boring locations located east of the refinery site. At these locations the alluvial materials appear to be absent likely because of the influence of the drainage to the east of the refinery where most of this material has been eroded from the surface of the Chinle. Otherwise the gravelly material makes an excellent marker bed on the site and indicates the top of the Chinle is within a few feet or inches.

The alluvial material is relatively thick on the bluff area where the plant facility is located. At some locations on the bluff area the material is upwards of twenty-five feet in thickness. Generally, however, the layer is on the order of two to three feet thick. On the extreme north side of the property this zone is a matter of inches thick.

Descending from the bluff area to the valley north of the facility, alluvial outwash material intertongues with fluvial materials deposited by the intermittent Rio Puerco. Within a short distance of the toe of the bluff the soils are totally fluvial materials. These soils are typically clays derived from the reworked Chinle shales and redeposited during Rio Puerco flood events. The clays are firm to hard, wet but not water bearing and have a high montmorillonite content that makes them nearly impervious to moisture penetration when uniform. Occasionally, sandy material is encountered in the clay body. These sands are channel deposits and tend to be sinuous, discontinuous bodies. The sands are more frequently found on western portion of the site. Occasionally the sands interconnect and are able to transmit water, however, because of the discontinuous nature of the bodies it is difficult to predict the movement of water in these sands.

To summarize the site is located in a Chinle erosional valley. The refinery itself is situated on a bluff that is composed of relatively granular alluvial materials. These coarser materials intertongue with fluvial deposits near the toe of the bluff area and are replaced completely by the fine grained materials a short distance north of the toe of the bluff area. The coarser grained materials do, however, extend nearly over the entire site at the interface of the unweathered Chinle Formation and the more recent alluvial and fluvial deposits above. The Chinle Shale extends below the entire site. The Sonsela sandstone bed that is confined within the shales below the developed area of the refinery site is a potential aquifer. It is the only water bearing layer within the Chinle until the older San Andreas and Yeso Formations are encountered approximately 800 feet below the present day surface. These Permian formations are the aquifers for potable water in the Ciniza area.

Introduction

The intent of this report is to provide a summary of stratigraphic conditions at the Land Treatment Area located in the northwest portion of the Ciniza Refinery property. The interpretations made are derived from the data of past investigations in the area as well as logs from borings and well installations performed by Precision Engineering, Inc. in the area of the refinery as well surface studies we have made on surrounding properties. All subsurface data in the area has been digitized and modeled as surfaces based on general environments of deposition.

Historical Interpretations

Past reports indicate the entire site is, in essence, a part of a highly weathered section of the Chinle Formation. An unconsolidated sandy stringer within this highly weathered shale formation was known to be water bearing. This unconsolidated sand was named the Ciniza Sand and is consistently referred to in reports after 1985. The nomenclature is local only and is not a documented bed name within the Chinle Formation. Some reports refer to the "Ciniza Sand" as a sandstone, however, it has never been shown to have any degree of cementation. Below the "Ciniza Sand" is a sandstone bed that lies within unweathered shale. This sandstone bed is known as the Sonsela Sandstone which is a documented unit name within the Chinle Formation. The bed is water bearing and represents a potential aquifer in the Ciniza area and is being used as an aquifer in the Bluewater area.

The Ciniza Sand was interpreted to vary in thickness below the Land Treatment Area. The zone was also thought to pinch out completely to the west and reach a maximum thickness of approximately five (5) feet in the south central portion of the Treatment Area.

The SMW well series was placed to monitor water quality in the "Ciniza Sand" since some water was encountered in the sands. The wells vary substantially in depth ranging from approximately forty six (46) feet at SMW-1 to seventy four (74) feet at SMW-5. Formation dip was used to explain the differences in depth initially, although it was later thought there may be two beds comprising the "Ciniza Sand".

The MW well series monitors the water from the Sonsela Sandstone. These wells range in depth from approximately one hundred twenty (120) to one hundred twenty seven (127) feet in depth.

Current Stratigraphic Interpretation

During the course of various subsurface investigations at the refinery site, including the Land Treatment Unit, inconsistencies were noted in the logs of early investigations and the findings of more recent studies. One major inconsistency noted was that the depth to unweathered shale greatly varied from the OW series wells to all other findings. It was also noted that the upper fifty (50) to sixty (60) feet of sediments in the Land Treatment Unit did not match what should have been encountered in a weathered shale section of the Chinle Formation. As a result of the inconsistencies, the Land Treatment Area was modeled based on all borings that have been drilled in the area in an effort to accurately define the stratigraphy.

The results of the modeling show a much more complex subsurface environment than had originally been assumed. The upper fifty (50) to sixty (60) feet of sediments are not weathered in place sediments of the Chinle Formation. Although the sediments have a Chinle Formation parent material, the time of deposition is believed to be much later. Although not dated, the structure of the soils suggests a relatively recent fluvial environment of deposition. Charcoal is abundant in sandy sediments and occasionally encountered in the clay sediments. Some carbonate accumulation can be noted in the soils. No evidence of cementation of the sediments has been observed. It is believed dating would place the age of the sediments in the range of a few thousand years to a few tens of thousands of years - much younger than the Chinle Formation.

To a depth of approximately ten (10) feet the entire Land Treatment Area is comprised of a high density, high plasticity clay. Below the ten (10) foot depth and within the fluvial materials comprising the upper fifty (50) to sixty (60) feet of the valley floor below the Land Treatment Area is a sandy zone that extends roughly from the ten (10) foot depth to approximately the thirty to forty (40) foot depth. Grossly speaking the sandy unit can be subdivided in to two smaller units. The upper unit is about ten (10) feet thick and the lower unit is about ten (10) to fifteen (15) feet thick. On the south end of the Land Treatment Area the units are separated by a clay zone on the order of five (5) to ten (10) feet in thickness. On the north end of the treatment area the two zones become indistinguishable and appear as a single unit. Whether or not the upper or lower unit pinches out is not fully understood, however, it is suspected the upper unit thins and blends with the lower unit. It should be noted that the sandy zone is best described as interbedded very fine sands, silts and clays that should be expected to hydraulically interconnect. On the south end of the Treatment Area the lower sandy zone is water bearing below approximately the thirty (30) foot depth. To the north no water is encountered in this zone. The approximate extent of water in this zone may be represented by a line extending from the southwest corner of the Area to the northeast corner. Wells SMW-1, 2, and 3 derive their water from this zone. This zone is

the original "Ciniza Sand" referred to in earlier work. This sandy zone represents channel deposition believed to be the result of infilling from the ancestral Rio Puerco or, more likely, derived from the Four Mile Canyon drainage system to the east of the Ciniza Refinery property. The channels of this zone trend roughly from northeast to southwest.

Below the sandy zone is a thick clay bed. The bed represents a very low energy environment likely as a result of flood plain deposits of the ancestral Rio Puerco. The clays are hard, high plasticity, moist to wet (but not water bearing) and brown to reddish brown. Occasionally sample specimens show evidence of mud cracks indicating a wetted then dry environment after the initial deposition. No free water has ever been detected in this zone.

Immediately below the clay zone is another sand bed. The sand may or may not contain gravel made up of subrounded sandstone fragments, petrified wood, and rounded to subrounded multi-colored chert fragments one to two inches in greatest dimension. In some areas this bed is composed only of fine sand. The sands are red to brown. The bed thickness ranges from three (3) inches to one foot or more. Some logs indicate this zone up to three (3) feet in thickness, although records at Precision Engineering, Inc. only show these thicknesses apparent south and east of the Land Treatment Area. The significance of this bed is two fold. First, in all locations where this zone has been penetrated it has been water bearing. Secondly, it always lies immediately above shale or sandy shale of the upper portion of the Petrified Forest Member of the Chinle Formation. Water from this zone has never been shown to penetrate more than a few inches into the Chinle Formation. The shales below the zone are typically damp to dry; more often than not they are dry. This bed most likely represents alluvial deposition on the ancient exposed Chinle surface. It is felt this bed, at least in the refinery property area, may be used as a marker to represent the boundary between younger valley infilling and true Chinle Formation shales below.

Significantly, the thin sand bed described above is derived from a different environment of deposition. Hydraulic connection to the upper fluvial sands has, as yet, not been demonstrated and the two zones may not connect. Shallow Monitoring Wells (SMW) 4, 5, and 6 produce out of this zone. This bed has also been referred to as "Ciniza Sand" in earlier reports.

Shales and sandy shales of the Chinle formation lie below the valley fill materials. Approximately, thirty (30) to fifty (50) feet of shale lies between the valley fill and the Sonsela Sandstone bed that lies within the Chinle Formation. The sandstone is on the order of ten (10) to thirty (30) feet in

thickness. The Sonsela Sandstone is water bearing at the refinery site and as stated earlier meets the definition of a potential aquifer.

The lower boundary of the Sonsela Sandstone is the extent of the modeling on this site. It is known from deep well logs that the Chinle Formation is on the order of seven hundred fifty (750) feet in thickness where deeper, established aquifers are encountered.

Summary

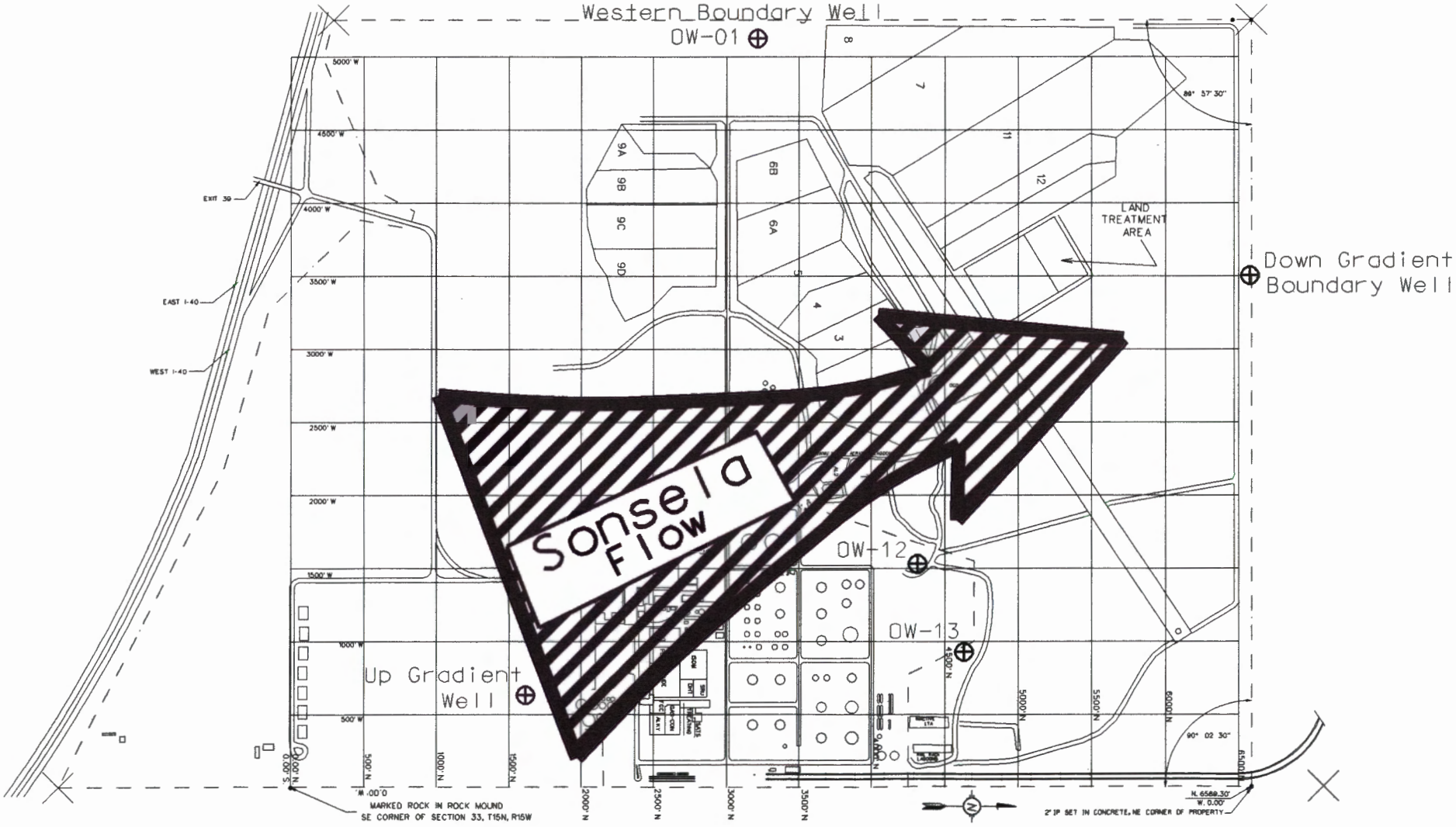
To summarize the current model of the stratigraphic section below the Land Treatment Area, a typical section through the area would be as follows:

The upper ten (10) feet of the site would be comprised of a dense dry to damp clay of high plasticity overlying two sequences of channel sands and silts separated by a clay zone on the order of five (5) to ten (10) feet in thickness. The channel sands would be expected to be on the order of ten (10) to fifteen (15) feet in thickness each. The channel sands are actually interbedded sands, silts, and clays. Below the thirty (30) foot depth in the southern part of the LTA the sandy zone is water bearing. In the northern part the zones are not water bearing. A fifteen (15) to twenty (20) foot thick section of clay is encountered next. The clay is hard, highly plastic, not water bearing, and may show shrinkage cracking structure. Below this, a thin water bearing sand, gravel, or, sandy gravel composed of aggregates of mixed sources is encountered next and represents alluviation from the higher areas to the south into the valley. Below is generally unweathered shale for thirty (30) feet. The top of the shale should be encountered at an average of sixty (60) feet below the surface but may be as shallow as fifty (50) feet to the south and as deep as seventy (70) feet to the north. The water bearing Sonsela Sandstone is then encountered and should be from ten (10) to thirty (30) feet in thickness.

GIANT REFINING

CINIZA REFINERY

DIRECTION OF WATER FLOW ON THE SONSELA SURFACE

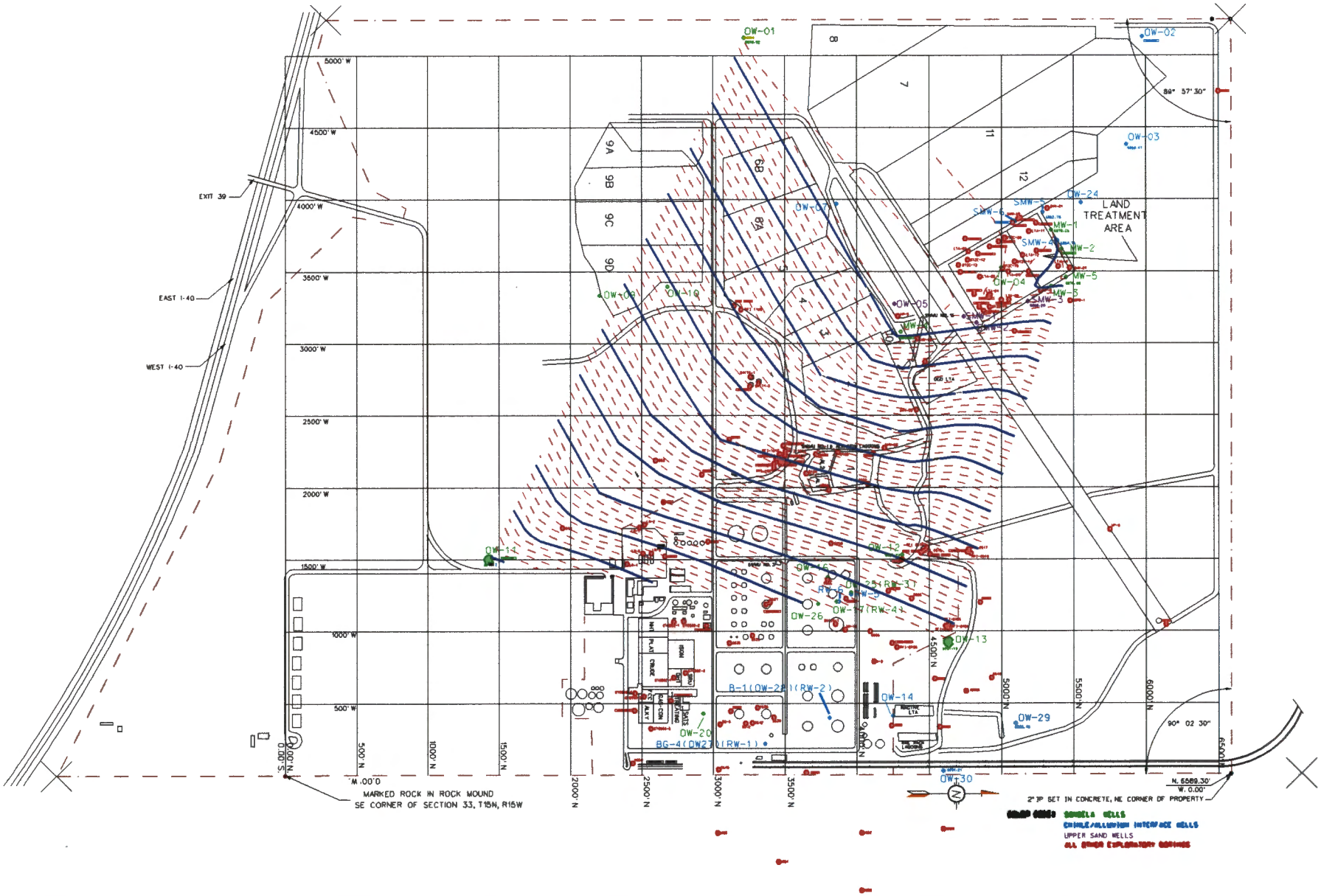


CINIZA REFINERY

SONSELA WATER ELEVATIONS

h2oele1

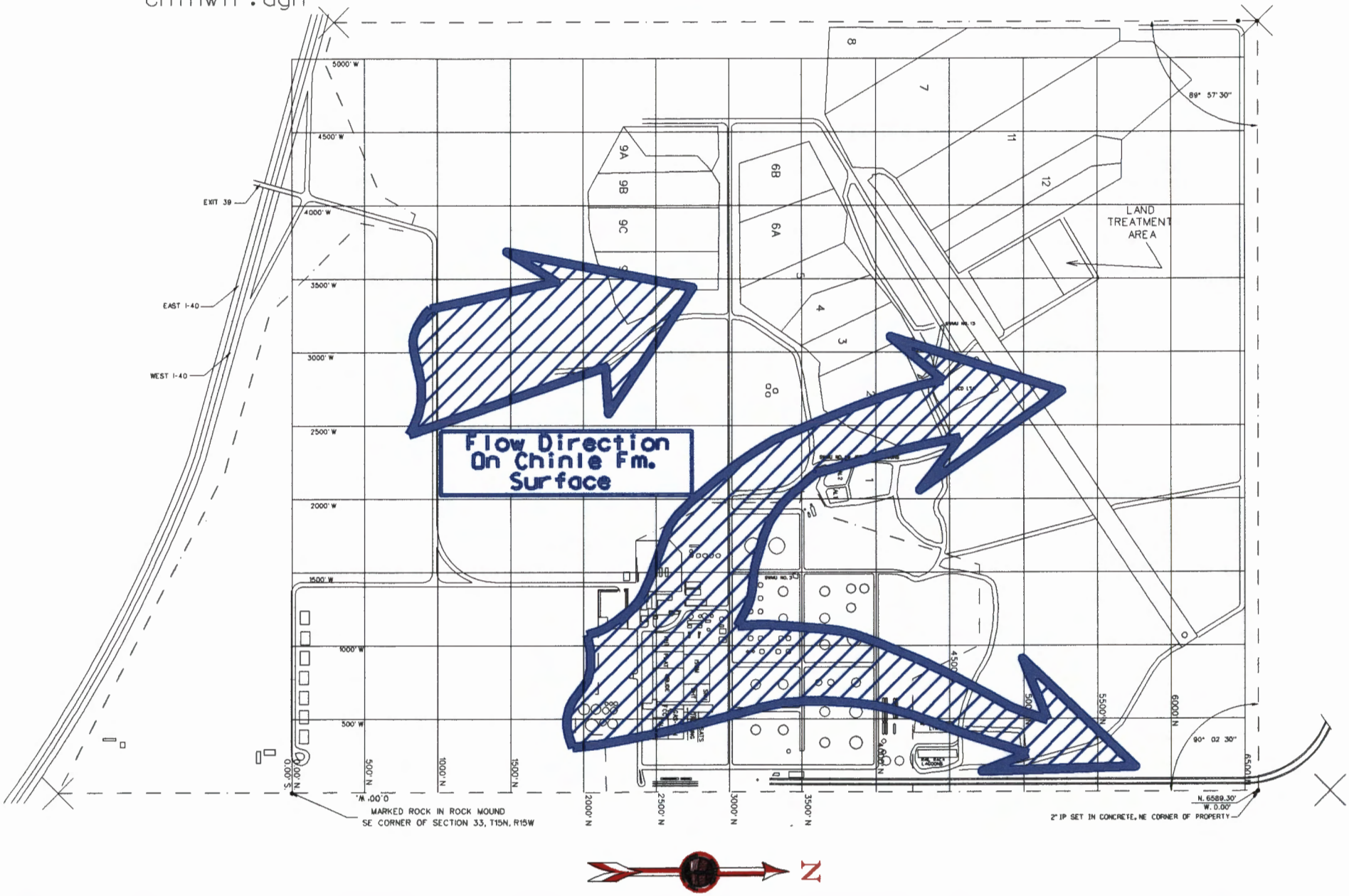
OCTOBER 23, 1998



CINIZA REFINERY

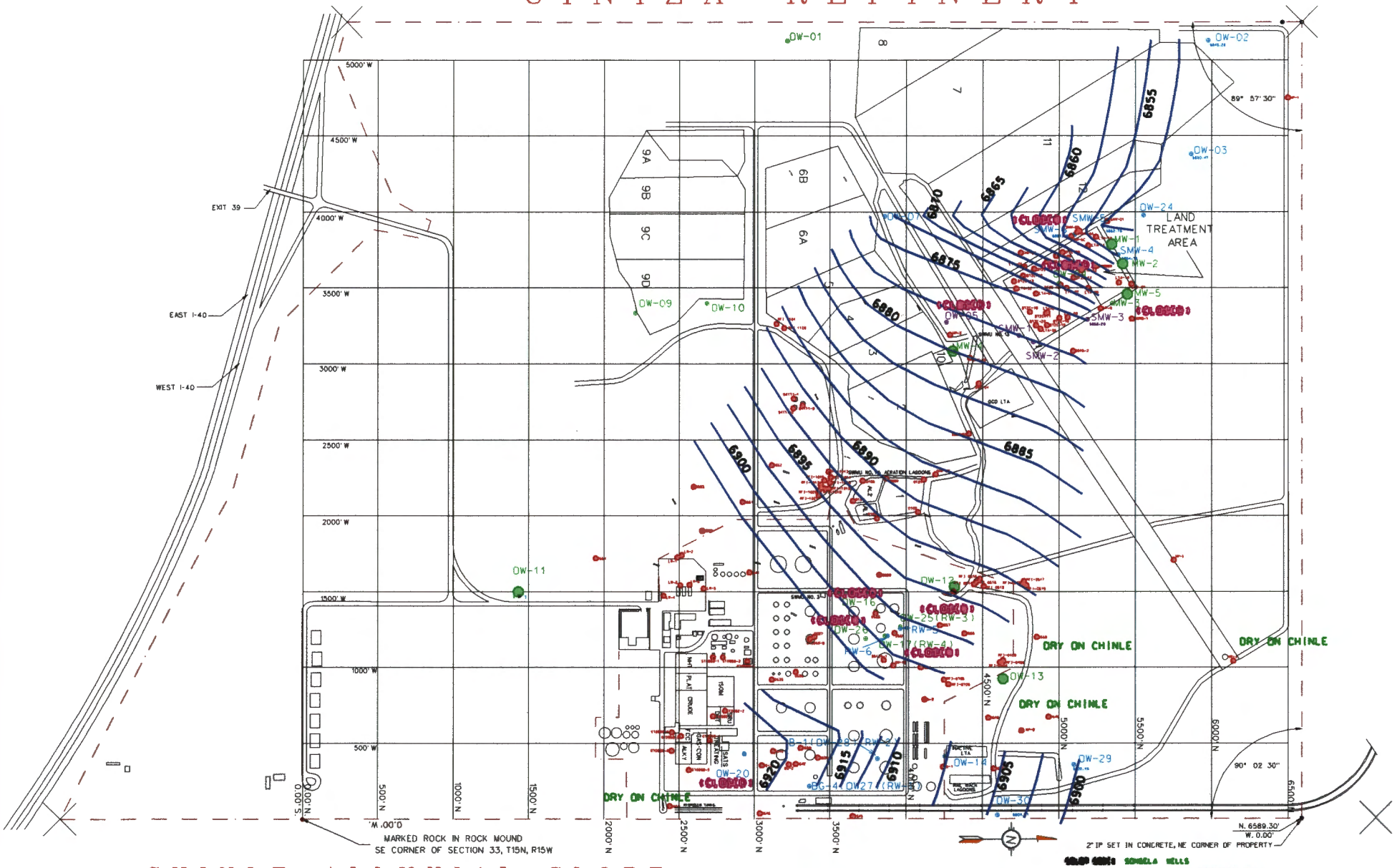
Flow Direction on Top of The Chinle Formation

chinwtr.dgn



sons|h2o

CINIZA REFINERY



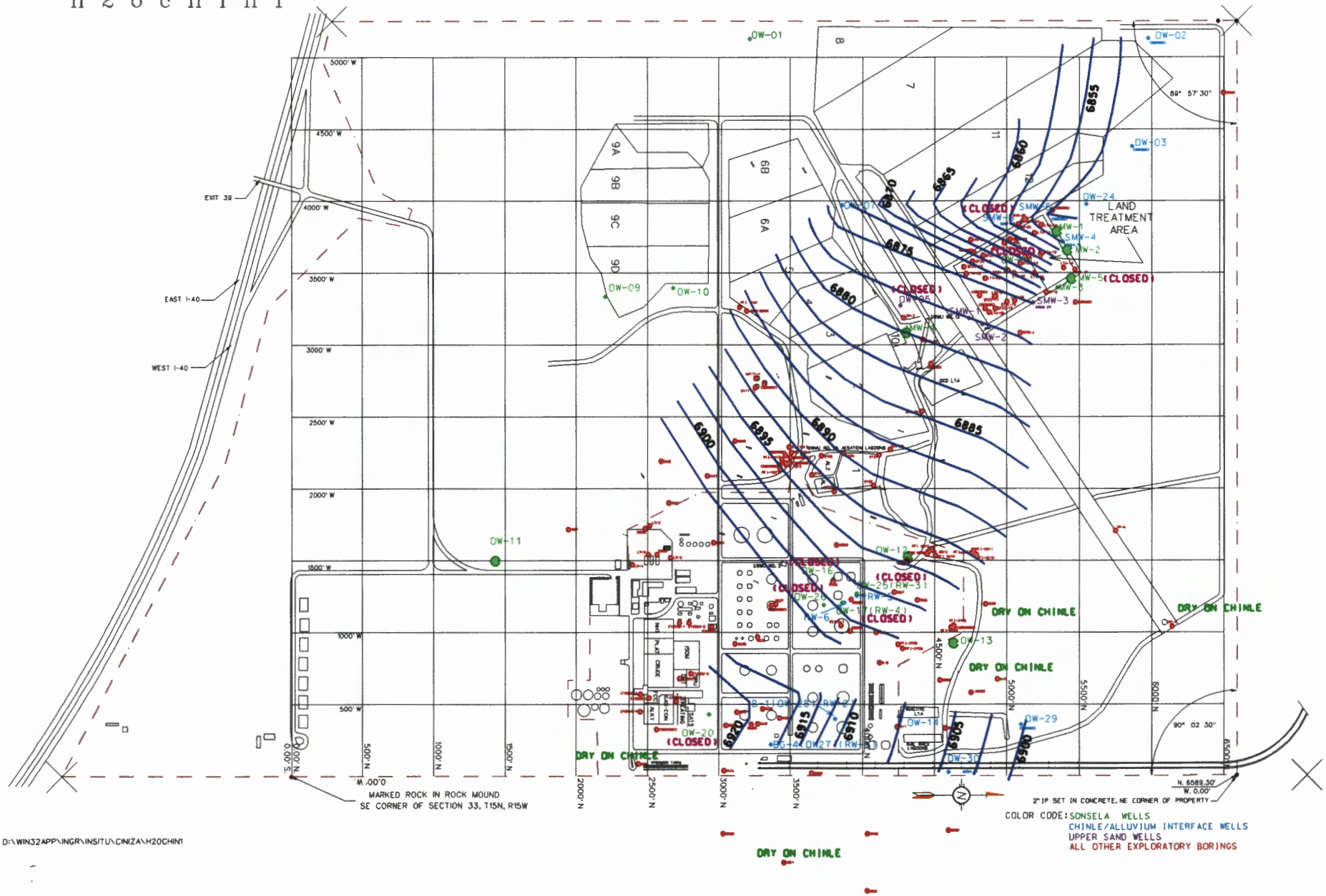
CHINLE ALLUVIAL SLOPE
PIEZOMETRIC SURFACE
OCTOBER 23, 1998

CINIZA REFINERY

CHINLE WATER ELEVATIONS

OCTOBER 23, 1998

h2ochin1



D:\WIN32APP\INGR\INSITU\CINIZA\H2OCHIN1

TO VIEW THE MAP AND/OR MAPS WITH THIS DOCUMENT, PLEASE CALL THE HAZARDOUS WASTE BUREAU AT 505-476-6000 TO MAKE AN APPOINTMENT

GROUND WATER AND SOILS INVESTIGATION

CINIZA REFINERY

NEAR GALLUP, NEW MEXICO

FOR SHELL OIL COMPANY

Dames & Moore

Dames & Moore

6400 Uptown Boulevard N.E., Suite 398-W, City Centre
Albuquerque, New Mexico 87110
(505) 883-5885

March 11, 1981

Shell Oil Company
Box 7, Route 3
Gallup, New Mexico 87301

Attention: Mr. Mitchell Sapp

Gentlemen:

This letter transmits three (3) copies of our final report, "Ground Water and Soils Investigation, Ciniza Refinery, Near Gallup, New Mexico, For Shell Oil Company". This work was performed under Purchase Order No. CR-2149.

The report provides a significant part of the information required to develop a closure plan and post-closure plan for a hazardous waste land treatment facility as prescribed under RCRA.

We have appreciated the opportunity to perform these services for Shell Oil Company. Please contact us if there are any questions.

Yours very truly,

DAMES & MOORE

William E. Mead

William E. Mead
Partner

WEM:lj

Attachment

GROUND WATER AND SOILS INVESTIGATION

CINIZA REFINERY

NEAR GALLUP, NEW MEXICO

FOR SHELL OIL COMPANY

Dames & Moore

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EXECUTIVE SUMMARY

The following summarizes our conclusions from this investigation:

1. The Ciniza Refinery property is underlain by a sandstone aquifer which dips less than three degrees to the northwest and ranges in depth from about 70 feet near the south limit of the main refinery complex to about 143 feet near the northwest property boundary. This is the uppermost (or "near-surface") continuous aquifer at the site and it contains ground water under artesian confinement. Clay and weathered shale overlie the aquifer. The shale contains some discontinuous sandy intervals.

2. Five of the seventeen observation wells drilled under this project show some evidence of chromium or lead contamination. Four of these wells are completed in the near-surface aquifer. Fluoride is several times background in most of the wells. It is possible that the contamination detected in one or more of these cases occurred during sample collection.

3. The land treatment area is underlain by about 100 feet of clay and shale above the near-surface aquifer. The piezometric surface of the confined aquifer lies approximately 71 feet above the top of this unit. In our opinion, the aquifer is sufficiently protected from potential contamination originating in the land treatment area to warrant seeking an exemption from the RCRA ground-water monitoring requirement.

4. Recommendations are presented in this report for future ground water quality monitoring in the general plant area and for monitoring the

unsaturated zone at the land treatment site.

GROUND WATER AND SOILS INVESTIGATION

CINIZA REFINERY

NEAR GALLUP, NEW MEXICO

FOR SHELL OIL COMPANY

1.0 INTRODUCTION

This report presents the results of our investigations at the Ciniza Refinery of Shell Oil Company near Gallup, New Mexico, relative to ground-water conditions in the general vicinity of the plant and soil conditions in the area to be used for treating solid waste. Field work was commenced on October 27, 1980 and completed on January 6, 1981.

2.0 PURPOSE AND SCOPE OF WORK

The purpose of the work described herein was to provide data necessary for compliance with the Interim Status permitting requirements of the Resources Conservation and Recovery Act of 1976 (RCRA), and included the following objectives:

1. To characterize the geohydrologic regime in the plant area and its immediate vicinity.
2. To evaluate the extent of ground-water contamination, if any, at the site and the degree to which it may be attributable to plant operation.

3. To assess the background physical and chemical characteristics of the soils and/or rock material in the area used for land treatment of solid waste.

4. To assist Shell Oil Company in achieving compliance with the RCRA Interim Status Standards.

The scope of work undertaken to fulfill the above objectives comprised essentially Phases I and II of the four-phase program described in our original proposal dated October 2, 1980, and included:

1. The drilling of 17 observation wells.
2. The collection of ground-water samples and measurement of the water table.
3. The excavation of five test pits in the land treatment area.
4. The collection of bulk and in-situ soil samples from the test pits.
5. The laboratory analysis of ground-water and soil samples for selected physical and chemical parameters.
6. Assistance to Shell Oil Company in preparing a description of the land treatment area and a preliminary plan for monitoring and sampling this area during waste disposal activities.
7. Preparation of a report describing the results of these investigations.

3.0 SITE DESCRIPTION

The Ciniza Refinery is located in Sections 28 and 33 of T.15N., R.15W, and in Section 4 of T.14N., R.15W., N.M.P.M. Drainage is north and west toward the South Fork of the Puerco River, a westward-flowing

intermittent stream.

The western two-thirds of the property is nearly flat with a slight northwestward topographic gradient. The eastern one-third is dominated by a bedrock bluff which is 60 to 100 feet higher than the adjacent flatland. The base of the bluff is at approximate elevation 6,900 feet (ASL). The general features of the site and the principal plant facilities are shown on Plate 1.

Geologically, the site occupies the northeast flank of the Zuni Uplift region of the Colorado Plateau. The flatlands have been mapped as Quaternary alluvium and the bedrock bluff has been identified as the Sonsela Sandstone of the Chinle Formation (Shomaker). The regional geology is depicted on Plate 2.

4.0 METHODS OF INVESTIGATION

4.1 FIELD INVESTIGATIONS

4.1.1 Land Treatment Area

Shell Oil Company treats certain plant wastes such as the API separator emulsion and leaded tank sludge by mixing with natural soils. Laboratory analyses of selected constituents in these wastes are provided in Appendix B-3.

An area on the plant property comprising approximately 7.9 acres and divided into three equal plots has been delineated for the initial phase of this land treatment operation and is shown on Plate 1.

Five test pits were dug by backhoe at representative locations in the land treatment area. The purpose of the pits was to obtain samples of the uppermost several feet of natural soils in order to analyze their chemical and physical characteristics. The pits were designated as LF-1 through LF-4, and OW-4. In four of the pits, bulk samples were cut from a clean pit wall at depth intervals of 0 to 1 foot, 1 to 2 feet, and 2 to 3 feet. In OW-4, samples were collected also from depths of 3 to 4 feet, 4 to 5 feet and 5 to 6 feet. The samples were placed in plastic-coated cloth bags and shipped to Santa Fe for analysis.

In addition to bulk samples, in-situ samples were obtained at four of the pit locations using the Dames & Moore sampler. Relatively undisturbed drive samples six inches in length were collected from a depth of 6 to 12 inches in pits LF-1, LF-2 and LF-4, and from 18 to 24 inches of depth in pit OW-4. The samples were sealed at the site and shipped to the laboratory.

Infiltration capacity measurements in the surficial soils were obtained near three of the pit locations (LF-2, LF-4, OW-4) by means of double ring infiltrometer tests. In these tests, two concentric metal cylinders, 12 inches and 9½ inches in diameter respectively, were driven approximately four inches below the ground surface. A buffer pond of water was established in the section between the cylinders and maintained during the test. Water was then added to the inner cylinder and the rate of water level decline recorded over time. In order to maintain an approximately constant head during the test, the original water level was periodically restored by adding measured quantities of water. Measurements were continued until the rate of infiltration stabilized.

4.1.2 Ground-Water Investigation

Seventeen observation wells were drilled by percussion methods to investigate the near-surface geology and ground-water hydrology at the site. Permits to drill these wells were issued by the New Mexico State Engineer. Original plans envisioned as many as 20 to 25 wells being drilled. However, fewer wells were found to be necessary to adequately describe the hydrogeologic conditions. The wells ranged in depth from 45 to 163 feet and were drilled either at 8 or 10 inches in diameter. A total of 1,505 feet of drilling was completed. Four-inch diameter PVC casing was installed in each well and included a perforated section at the desired depth interval. Approximately two feet of PVC casing were allowed to extend above ground level and the bottom end of the casing was plugged. The annular space between the PVC casing and the wall of the boring was packed with gravel opposite the perforations and for a distance of several feet above the top of the perforations to allow for settlement. A Quick-Gel bentonite seal was emplaced above the gravel pack for an interval that varied from 5 to 15 feet among the several wells. The bentonite was followed either by sand concrete or by cement grout which extended to the ground surface. Grout emplacement was achieved by using a tremie pipe. Most of the wells which penetrated the sandstone artesian aquifer were inspected by a representative of the State Engineer's office during the grout emplacment.

A protective steel casing 8-5/8 inches in diameter fitted with a locking cap was installed over the above-ground extension of the PVC casing in each well and was cemented in place.

The completed well was flushed clean of drilling mud and cuttings to permit the inflow of fresh ground water. Measurements of water level, water temperature and electrical conductivity were obtained at the time of well completion. The water level in each well also was recorded at frequent intervals during the remainder of the field program. Records of all wells were submitted to the State Engineer on the prescribed forms.

Collection of ground-water samples for analysis was normally delayed until the water table had stabilized. A Kemmerer-type PVC water sampler was utilized which could be opened at any desired depth below the water table. Samples were collected near the water table and transferred to either polyethylene or tinted glass bottles. Containers of the latter type were used for samples to be analyzed for hydrocarbons.

Various methods were utilized to preserve or buffer the water samples against changes in composition during the period between collection and laboratory analysis.

Samples requiring determinations of TDS, pH, Cl, SO_4 and F were packed in ice for shipment. Sulfuric acid was added to samples collected for nitrate analysis. Samples to be tested for Se, Fe, Cr, As, Ca, Na and Mn were buffered with concentrated nitric acid to a pH less than 2.0. Analysis for CN required that a pH of at least 12 be maintained in the sample, which was achieved by adding NaOH in controlled amounts.

4.2 LABORATORY INVESTIGATIONS

4.2.1 Land Treatment Area

Samples from the top foot of soil at the five sampling locations in the land treatment area were individually analyzed for pH, TOC, EP

toxicity (inorganic), and total metals in the EP toxicity series. EP toxicity tests for potentially hazardous inorganic constituents were run in accordance with RCRA specifications for As, Ba, Cd, Cr, Cr^{+6}, Pb, Hg, Se and Ag.

Soil from a depth of 12 to 24 inches and from 24 to 36 inches at each of the five sampling locations was tested for the same parameters as the top 12 inches, with the exception of pH.

At the center pit location, the samples collected from 3 to 4 feet, 4 to 5 feet and 5 to 6 feet of depth were analyzed for total chromium.

A portion of the sample from the top foot of soil at locations LF-1 and LF-2 was combined into a composite bulk sample and analyzed for grain size distribution (sieve analysis), N, P, cation exchange capacity and sodium adsorption ratio. A composite also was prepared from the top foot of soil at locations LF-3, LF-4 and OW-4 and similarly tested.

Finally, the in-situ soil samples obtained from 6 to 12 inches of depth in LF-1, LF-2 and LF-4, and from 18 to 24 inches in depth in OW-4 were tested in the laboratory for hydraulic conductivity (permeability) and moisture content.

4.2.2 Ground-Water Investigation

A suite of parameters was chosen for the chemical analysis of ground water which was judged to be adequate to determine its overall quality within the confines of the Shell property. In selecting these parameters, consideration was given to constituents which have been present in relatively high concentrations in the effluents discharged

to the evaporation ponds as indicated from previous analyses of the pond effluent.

The parameters tested were as follows:

pH	CN	Fe	Na
TDS	F	Cr	Mn
Cl	NO_3	As	Pb
SO_4	Se	Ca	

Water samples from wells constructed in the immediate area of the refinery and product storage tanks were analyzed additionally for immiscible hydrocarbons such as grease and oil which possibly could have reached the water table from surface spills of diesel oil, fuel oil or gasoline.

5.0 RESULTS

5.1 LAND TREATMENT AREA

5.1.1 Soil Characteristics - Physical

The land treatment area is underlain by silty clay which extends below the five-foot depth of excavation in four of the five test pits and to a depth of about 25 feet in the center test pit (OW-4). The upper three to four feet of clay contains closely spaced herbaceous roots and dessication cracks. Logs of the test pits are presented in Appendix A-1. Gradation curves representing composites of the upper one foot of soil are shown on Plates 3-A and 3-B.

Below 25 feet of depth, the clay grades to variably decomposed sandy shale which extends nearly to 100 feet. From 90 to 100 feet the

shale becomes calcareous and at 100 feet, a fine-grained sandstone is encountered.

The water table in OW-4 stabilized at about 29 feet below ground.

In parts of the land treatment area devoid of dessication cracks, the infiltration capacity of the surficial soils is estimated to be on the order of 1 to 3 inches per hour or 5 to 20×10^{-4} centimeters per second (cm/sec). These estimates are based on infiltrometer tests conducted at three locations (LF-2, LF-4 and OW-4). The test results are shown on Plates 4-A through 4-C and in Table 1-A.

Based on laboratory permeability tests, the vertical hydraulic conductivity in the upper two feet of soil is on the order of 2.2×10^{-5} cm/sec and the moisture content averages 9.8 percent (Table 1-A).

5.1.2 Soil Characteristics - Chemical

The results of chemical analysis of the soils in the land treatment area are given in Tables 1-A and 1-B. These analyses represent background conditions. Copies of the laboratory reports are presented in Appendix B-1.

The pH of the top foot of soil ranged from 8.4 to 8.9 at the five sampled locations. Total organic carbon in this depth interval ranged from 4,700 to 4,800 micrograms per gram (ug/gm). Two soil composites from the top foot possessed an average cation exchange capacity of 43.3 milli-equivalents per hundred grams (meq/100gm) and a sodium adsorption ratio ranging from 9.5 to 18.4. Nitrogen content varied from 420 to 540 ug/gm and phosphorus content was 180 ug/gm in the top foot of soil.

In the second and third foot of soil, the total organic carbon content was 4,700 ug/gm in all but one sample (LF-3 from 2 to 3 feet).

TABLE 1-A

SUMMARY OF SOILS ANALYSES

LAND TREATMENT AREA

SAMPLE LOCATION	NITROGEN (ug/gm)[1]	PHOSPHORUS (ug/gm)	CEC[2]	SAR[3]	SIEVE ANALYSIS	K_F[5] (cm/sec)	K_L[6] (cm/sec)	MC[7]
Composite								
LF-1 + LF-2								
0-12"	420	180	43.9	9.5	[4]			
Composite								
LF-3 + LF-4 + OW-4								
0-12"	540	180	42.8	18.4	[4]			
LF-1								
6-12"							1.9×10^{-5}	10.2
LF-2								
Surface						4×10^{-4}		
6-12"							1.6×10^{-5}	9.3
LF-4								
Surface						18×10^{-4}		
6-12"							2.2×10^{-5}	9.1
OW-4								
Surface						9×10^{-4}		
18-24"							3.2×10^{-5}	10.1

[1] Micrograms/gram

[2] Cation exchange capacity in meq/100 grams

[3] Sodium adsorption ratio

[4] See Plate 3

[5] Field infiltration capacity

[6] Laboratory permeability (vertical)

[7] Moisture Content (% of dry weight)

TABLE 1-B

SUMMARY OF SOILS ANALYSES

LAND TREATMENT AREA

(in milligrams/liter except as noted)

SAMPLE LOCATION	pH[1]	TOC[2]	As	Ba	Cd	Cr	Cr^{+6}	Pb	Hg	Se	Ag
LF-1											
0-12"	8.6	4800									
EP Toxicity			<0.01	<10	0.002	<0.001	<0.01	<0.001	<0.0004	0.01	<0.01
(RCRA limits)			(5)	(100)	(1)	(5)	(5)	(5)	(0.2)	(1)	(5)
Total Metals [3]			20	980	0.2	34	<1	26	0.04	<1	7.8
12-24"	-	4700									
EP Toxicity			<0.01	<10	0.001	<0.001	<0.01	0.003	<0.0004	<0.01	<0.01
Total Metals			50	970	0.2	34	1	27	<0.04	<1	<1.0
24-36"	-	4700									
EP Toxicity			<0.01	<10	0.001	<0.001	<0.01	0.002	<0.0004	<0.01	<0.01
Total Metals			50	860	0.2	34	<1	24	0.05	<1	2.2
LF-2											
0-12"	8.4	4800									
EP Toxicity			<0.01	<10	0.001	<0.001	<0.01	0.001	<0.0004	<0.01	<0.01
Total Metals			40	970	0.2	29	<1	28	<0.04	<1	2.0
12-24"	-	4700									
EP Toxicity			<0.01	<10	0.002	<0.001	<0.01	<0.001	<0.0004	<0.01	<0.01
Total Metals			50	1,100	0.3	39	1	26	0.1	<1	1.4
24-36"	-	4700									
EP Toxicity			<0.01	<10	<0.001	<0.001	<0.01	0.002	<0.0004	<0.01	<0.01
Total Metals			50	940	0.1	36	<1	23	<0.04	<1	<1.0
LF-3											
0-12"	8.9	4700									
EP Toxicity			<0.01	<10	0.002	<0.001	<0.01	<0.001	<0.0004	<0.01	<0.01
Total Metals			40	1,000	0.4	34	1	26	<0.04	<1	<1.0
12-24"	-	4700									
EP Toxicity			<0.01	<10	0.002	<0.001	<0.01	<0.001	<0.0004	<0.01	<0.01
Total Metals			50	970	0.2	45	<1	24	0.9	<1	<1.0
24-36"	-	4800									
EP Toxicity			<0.01	<10	0.002	<0.001	<0.01	0.001	<0.0004	<0.01	<0.01
Total Metals			40	870	0.2	40	<1	26	0.04	<1	<1.0
LF-4											
0-12"	8.7	4800									
EP Toxicity			<0.01	<10	0.001	<0.001	<0.01	<0.001	<0.0004	<0.01	<0.01
Total Metals			50	880	0.2	36	<1	29	<0.04	<1	2.7
12-24"	-	4700									
EP Toxicity			<0.01	<10	<0.001	<0.001	<0.01	<0.001	<0.0004	<0.01	<0.01
Total Metals			50	1,000	0.1	33	<1	23	0.09	<1	<1.0
24-36"	-	4700									
EP Toxicity			<0.01	<10	0.002	<0.001	<0.01	0.002	<0.0004	<0.01	<0.01
Total Metals			50	880	0.2	23	2	28	0.05	<1	<1.0
OW-4											
0-12"	8.5	4800									
EP Toxicity			<0.01	<10	0.001	<0.001	<0.01	0.003	<0.0004	<0.01	<0.01
Total Metals			40	930	0.2	30	<1	29	<0.04	<1	<1.0
12-24"	-	4700									
EP Toxicity			<0.01	<10	<0.001	<0.001	<0.01	0.003	<0.0004	<0.01	<0.01
Total Metals			50	970	<0.1	34	<1	23	0.05	<1	3.2
24-36"	-	4700									
EP Toxicity			<0.01	<10	<0.001	<0.001	<0.01	<0.001	<0.0004	<0.01	<0.01
Total Metals			50	890	0.3	29	<1	25	<0.04	<1	<1.0
36-48"						20[4]					
48-60"						20[4]					
60-72"						30[4]					

[1] Standard units

[2] Total organic carbon in micrograms/gram

[3] Total metals in all cases are reported in micrograms/gram

[4] micrograms/gram

In the fourth, fifth and sixth foot of soil at the center pit location, total chromium was 20 to 30 ug/gm.

5.2 GROUND-WATER INVESTIGATION

5.2.1 Site Geology

The property is underlain by the Chinle Formation. According to the drillers' logs for Water Supply Wells 1 and 2, the Chinle is about 730 feet thick at the site. Samples from the observation wells show that the upper 10 to 50 feet has weathered extensively and consists of reddish-brown silty clay or silty fine sand. The silty clay occurs in the vicinity of the evaporation ponds, and the silty fine sand occurs in the main plant area and near OW-11.

The silty fine sand in the main plant area is believed to be the weathered equivalent of the Sonsela Sandstone which has been mapped by others as the geologic unit comprising the bluff area. The Sonsela Sandstone here is an erosional remnant and does not extend below the ground surface beyond the bluff.

Unweathered bedrock consists of interbedded shale and sandstone. The uppermost bedrock unit is reddish-brown silty shale with some fine sand, which grades gray or brown with depth. It ranges up to about 110 feet thick. A discontinuous two-foot sandstone lense was found in this unit in some borings. Underlying the shale is a gray to brown fine- to coarse-grained sandstone, which henceforth will be referred to as the "near-surface aquifer". It can be easily traced in the observation wells and ranges from 12 to 30 feet thick. Below the near-surface aquifer is gray or reddish-brown silty shale with some fine

sand. None of the observation wells completely penetrated this unit.

The strike of the bedrock ranges from North 33° East to North 48° East and the bedrock dips between 1.4 and 2.7 degrees toward the northwest in the direction of the San Juan structural basin. Logs of the observation wells are provided in Appendix A-2. Cross sections through the plant area are shown on Plates 5-A and 5-B.

5.2.2 Site Ground-Water Hydrology

5.2.2.1 Physical Characteristics

For purposes of this report, only the hydrogeologic conditions to a depth of about 150 feet need to be considered. The near-surface aquifer, which was described in the previous section, occurs within 150 feet of the ground surface in the plant vicinity and would be the first aquifer to receive any contamination emanating from plant activities or other surface sources.

Ground water occurs under both artesian and water table conditions in the plant vicinity. Artesian conditions exist in the near-surface aquifer northwest of the plant where ground water rises more than 100 feet (OW-2) above the aquifer. The amount of rise decreases toward the southeast (up dip) and at OW-11, the water table was about 10 feet above the top of the aquifer on January 5, 1981. The area of direct recharge for the near-surface aquifer is estimated to be more than one-half mile south of the plant area.

In the shale which overlies the near-surface aquifer, water table conditions exist, as at OW-3, OW-7 and OW-24. Recharge to the weathered shale is maintained principally by surface infiltration and perhaps to

some degree by upward leakage from the near-surface aquifer.

Plate 6 shows the site ground-water elevations measured on January 5, 1981. These data are also summarized in Table 2. The ground-water table is influenced by local topography and the bedrock attitude. It is highest immediately beneath the plant, which is located on a topographic high. From the plant, the ground-water table slopes toward the northwest at one to two degrees (about 0.02 feet/foot), which is approximately the same as the dip of the bedrock. The slope decreases beneath the evaporation ponds to less than one degree (less than 0.02 feet/foot) toward the northwest. Based on the average gradient of the water table and estimates of shale permeability calculated from limited water level recovery data, the rate of ground-water movement is on the order of 0.4 feet/year, to the northwest.

5.2.2.2 Chemical Characteristics

The ground water in each observation well was analyzed chemically for selected naturally-occurring constituents as well as for potential contaminants from the refinery and its disposal areas. The results of these analyses are given in Table 3.

Well OW-11, the farthest upgradient well, is believed to represent approximate background water quality conditions. Elevated levels of fluoride appear to exist in several wells on the property. Chromium is above background range in OW-17, and in OW-20 exceeds the drinking water standard. Lead is close to the drinking water standard in OW-12, OW-13, OW-20 and OW-24. In OW-17, lead is ten times the standard.

OW-17 and OW-20 appear to be contaminated wells. Some trace of contamination also may be present in OW-12, OW-13 and OW-24. These

TABLE 2

SUMMARY OF WELL DATA

NAME	COORDINATES [1] NORTH	WEST	GROUND [1] ELEVATION	TOTAL DEPTH (ft)	DATE COMPLETED	AQUIFER [3][4] INTERVAL (ft)	DEPTH OF [2] WATER TABLE (ft)	ELEVATION WATER TABLE (ft)
OW-1	3190	5150	6868	99.5	11/10/80	86-98	6.4	6861.6
OW-2	5985	5125	6871	163	10/31/80	143-162.5	31.2	6839.8
OW-3	5855	4220	6876	67	11/04/80	-	34.4	6841.6
OW-4	4960	3565	6881	102	11/07/80	100-102	29.2	6851.8
OW-5	4325	2970	6882	92	11/12/80	82-92	16.2	6865.8
OW-7	3875	3740	6872	70	11/18/80	-	6.7	6865.3
OW-9	2215	3445	6873	60	11/21/80	23-46	0.6	6872.4
OW-10	2710	3470	6872	68	11/25/80	34-63	1.7	6870.3
OW-11	1365	1455	6923	150	12/30/80	30-40	20.2	6902.8
OW-12	4490	1540	6939	145	12/15/80	104-143	47.3	6891.7
OW-13	4790	970	6914	108	12/10/80	70-104	23.2	6890.8
OW-14	4245	495	6923	45	12/17/80	39-45	25.8	6897.2
OW-16	3800	1365	6942	55	12/02/80	47-50	26.8	6915.2
OW-17	3885	1195	6941	50	1/03/81	40-42	31.8	6909.2
OW-18	3955	1020	6932	82	12/04/80	61-82	-	?
OW-20	2965	410	6961	83	12/19/80	70-82	50.2	6910.8
OW-24	5475	3875	6878	65	1/02/81	-	32.5	6845.5
				1,505				

[1] Estimated - survey required

[2] Last measurement Jan.5, 1981

[3] Depth underlined is maximum depth of well

[4] Does not include zones of sandy shale below

TABLE 3

SUMMARY OF GROUND-WATER CHEMICAL ANALYSES
(in milligrams per liter except as noted)

OBSERVATION WELL	pH[1]	TDS	Cl	SO_4	CN	F	NO_3	Se	Fe	Cr	As	Ca	Na	Mn	Pb	TEMP. (C°)	EC[4] (umhos)	HC[5]
OW-1	7.8	776	28	167	<0.1	0.55	0.5	<0.01	0.07	0.007	<0.01	7.6	270	0.04				
OW-2	7.6	856	39	16	<0.1	1.6	0.1	0.01	1.1	0.003	<0.01	20	390	0.2		11	1180	
OW-3	7.7	876	36	79	<0.1	1.4	<0.1	<0.01	1.8	0.007	<0.01	3.4	370	0.003		11.5	1280	
OW-4	8.1	741	57	188	<0.1	1.0	0.2	<0.01	0.1	0.005	<0.01	14	230	0.07				
OW-5	(well incorrectly completed for collection of ground water sample)																	
OW-7	8.7	717	21	166	<0.1	0.37	<0.1	<0.01	0.3	0.003	<0.01	34	270	0.02		12	1050	
OW-9	7.8	1060	56	391	<0.1	0.8	0.5	<0.01	0.02	0.004	<0.01	19	350	0.02		12.5	1575	
OW-10	7.6	1030	79	331	<0.1	0.64	0.3	0.01	0.6	0.002	<0.01	17	360	0.03		10	1474	
OW-11	7.8	935	88	196	<0.1	0.20	1.8	<0.01	0.3	0.003	<0.01	11	380	0.03	0.002	9	1500	
OW-12	7.5	746	120	100	<0.1	0.52	0.1	<0.01	0.7	0.004	<0.01	11	310	0.08	0.03			7.1
OW-13	8.5	659	19	207	<0.1	1.0	<0.1	<0.01	0.6	0.009	<0.01	6.5	270	0.06	0.03	13	1150	
OW-14	7.3	839	210	104	<0.1	0.62	0.2	<0.01	0.2	0.008	<0.01	34	290	0.06	0.02	11	1425	6.4
OW-16	7.6	799	230	15	<0.1	0.9	3.7	0.01	1.0	0.003	0.03	24	270	0.06				4.0
OW-17	7.4	818	86	319	<0.1	0.47	0.8	<0.01	0.5	0.02	0.02	400	250	4.2	0.5	11	1400	25.0
OW-20	11.6	841	100	214	<0.1	0.40	1.3	<0.01	0.3	0.1	<0.01	6.6	320	0.02	0.04	13	1950	5.5
OW-24	7.8	784	33	72	<0.1	0.70	0.5	<0.01	0.2	0.001	<0.01	23	310	0.3	0.03	9	1200	
NIPDWR[2]						2.4	10	0.01		0.05	0.05	-	-		0.05			
PSDWS[3]		500	250	250	0.2				0.3			-	-	0.05				

[1] Standard units
[2] National Interim Primary Drinking Water Regulations
[3] Proposed Secondary Drinking Water Standards
[4] Electrical conductivity
[5] Hydrocarbons - oil and grease

wells should be re-sampled after flushing to ascertain whether the results indicate ground-water contamination, sample contamination, or possible errors in analysis.

Most of the wells discussed above tap the near-surface aquifer in the vicinity of the plant area. The wells in the pond area and down-gradient from it exhibit no clear evidence of contamination in the near-surface aquifer. However, these wells should be analyzed for lead.

Wells OW-3, OW-7 and OW-24 penetrate only the shale above the near-surface aquifer. With the possible exception of lead in OW-24, these wells show no indication of being contaminated.

In the wells closest to the refinery product treatment and storage facilities, no evidence of appreciable hydrocarbons was found at the water table. However, gases of as yet undetermined composition were present in OW-14 and OW-20. The nature and source of these gases should be determined. Other wells completed in this area also should be checked for such gases.

In about 1970, Shell Oil Company installed 58 shallow monitor wells at the Ciniza property. Most of these wells were spaced at intervals of a few tens of feet along the toes of the dikes bounding the evaporation ponds on the west and south. Depths below ground ranged generally from 5 to 10 feet. The well casings extended above ground in most cases from 1.5 to 4 feet. When water levels in these wells were measured on September 30, 1980, 24 were found to be dry. In the other wells, the depth of the water ranged from about 1 to 9 feet below ground. Because geologic logs were not available, and because the method of well completion and present condition were unknown, water samples from these wells were not collected for analysis. Samples analyzed from three of these wells in December, 1976, indicated that

the water in some of the wells was contaminated. Based on the more recent drilling completed as part of the program described herein, it is fairly certain that all of the original 58 monitor wells penetrated only clay or weathered shale, and not an aquifer. It is probable that the contaminated water in these wells originated from seepage entering the well from the ground surface, and in some cases, from the ponds.

6.0 CONCLUSIONS

6.1 GENERAL

The primary objective of this investigation has been to comply with provisions of the Resources Conservation and Recovery Act of 1976 (RCRA), whose aim is to protect the nation's water resources from contamination. Generators of hazardous waste materials must satisfy regulations which require a thorough knowledge as to the chemical nature of the waste products, an understanding of the geohydrologic system which would be susceptible to contamination from these products, and an effective means of monitoring hazardous waste facilities to detect possible changes in the unsaturated zone or in ground water resulting from such operations.

6.2 GEOHYDROLOGIC REGIME

Based on the results of the present investigation, the physical aspects of the geohydrologic regime at the Ciniza Refinery are now fairly well understood.

Some contamination appears to exist in five of the observation wells, and in two of these wells, one constituent exceeds the Primary

Drinking Water Standard. Four of the five contaminated wells, including the two wells which exceed the standard, are located near the main plant and tank storage area and penetrate the near-surface aquifer.

Unless the wells were inadequately flushed following their completion, or the samples were inadvertently contaminated, it must be assumed that seepage from the plant has reached the near-surface aquifer. The mechanism responsible for this condition if it actually exists is not clear, considering the amount of hydrostatic head in the aquifer and the presence of overlying layers of low permeability clay and shale.

In the following section, recommendations are offered to confirm whether contamination is actually present in the aquifer or only apparent due to other causes.

The system of observation wells installed during this program can be utilized for future monitoring or ground-water conditions at the plant, although their main purpose was to gather baseline geohydrologic information. Evaluation of these data has indicated certain other locations in the general plant area which would be useful as monitoring sites but which are not essential for RCRA compliance.

6.3 LAND TREATMENT

In addition to overall ground-water characterization and monitoring at the Ciniza plant, the land treatment program undertaken by Shell Oil Company comes under the purview of the RCRA regulations. Paragraph 265.278 of Subpart M of the Interim Status Standards (Appendix C) sets forth the requirements for Interim Status compliance in a land treatment

area. Pursuant to this regulation, our studies evaluated the baseline or background physical and chemical characteristics of the soil and rock meterials in the unsaturated zone as well as the ground-water depth and quality. Also, a generalized plan was prepared for monitoring the unsaturated zone. This plan has been refined based on data obtained during the investigative program. In the land treatment area, 29 feet of low permeability clay and decomposed shale comprise the unsaturated zone above the water table. The water table itself is the piezometric surface of the near-surface (uppermost) aquifer, which lies below 100 feet of depth in this area.

No evidence of contamination in EP metals was detected in the surficial soils or the ground water beneath the land treatment site. OW-4 was not analyzed for lead, however, and there is an indication of slight lead contamination (0.03 mg/l) in OW-24 which penetrates the shale a few hundred feet downgradient (north) from the land treatment area.

The hydrostatic pressure head of the aquifer at this location is 71 feet above the top of the formation, thus affording little opportunity for the entry of contaminants even if they succeeded in reaching the base of the unsaturated zone. In our opinion, the near-surface aquifer is effectively isolated from any surface soil contamination which may result from land treatment operations due to the low permeability and chemical absorptivity of the natural medium which overlies the aquifer and to the substantial piezometric head above the aquifer.

7.0 RECOMMENDATIONS

7.1 GROUND-WATER MONITORING PROGRAM

7.1.1 Existing Wells

Sixteen observation wells are now available for monitoring ground-water conditions at the Ciniza Refinery. Several of these wells should be used for future quality sampling and water table measurement.

A small submersible pump of about 10 to 15 gpm capacity at a lift of 150 feet (approximate maximum depth to the top of the perforations) should be appropriate for flushing the monitor wells and obtaining samples for analysis. The pump should fit in the 4-inch PVC casing and its intake should be set just above the top of the perforated section. A pump setting at the bottom of the perforated section would be preferable but the wells have not been completely surge developed or properly screened. Pumping from this lower position would be more likely to induce sand inflow which, in time, could fill the perforated section. This problem may still occur even with the recommended pump setting, because the observation wells were not designed as permanent monitor wells.

The wells should be pumped until approximately three equivalents of the well volume below the water table have been removed. This process will serve to flush the formation and to clean the pump of possible contamination from the previous well sampled. An additional precaution would be to wash the pump with uncontaminated water after each sampling before installing it in the next well. A final washing at the conclusion of the sampling sequence would also be desirable before placing the pump in storage.

In the wells penetrating the near-surface aquifer, recovery time between pumping stages should be reasonably short. Wells completed in the shale, however, will require a much longer recovery period between pumping stages.

Each well should be allowed to recover after pumping before a sample is taken. One or two liter samples should be collected for each type of preparation required, using the appropriate container and preservation method described on Page 6.

Evidence of contamination was found in wells OW-12, 13, 17, 20 and 24. These wells should be re-sampled as soon as possible to confirm the preliminary results. In addition, wells OW-1 through OW-10 should be analyzed for Pb.

It is further recommended that wells OW-1, 2, 3, 4, 12, 17 and 20 be sampled every three months and the depth of the water table recorded. The samples should be analyzed for Cl, Fe, Mn, Na, SO_4, Cr, Cr^{+6}, Pb, F, As, Se, Cd and Ba. Some of these analyses may be discontinued after several samplings. Eventually, certain wells may be omitted or their sampling frequency extended.

7.1.2 Additional Monitor Wells

For the overall refinery complex, we believe that the existing network of observation wells will serve adequately for future monitoring.

Within the complex, however, the land treatment area has been designated as a hazardous waste facility under the RCRA criteria. As such, it must be considered separately from the other portions of the plant in determining the need for additional monitor wells. Monitoring of the land treatment facility is discussed in the next section of this report.

7.2 LAND TREATMENT AREA MONITORING PROGRAM

7.2.1 Monitor Wells

RCRA rules require that the uppermost aquifer beneath a hazardous waste facility be monitored with at least three downgradient wells and no less than one upgradient well. If adequate hydrogeological justification can be provided that there is low potential for the migration of contaminants from the hazardous waste facility into this aquifer, a waiver of the monitor well request can be granted.

In the present case, the extra monitor well (OW-4) in the land treatment area shows no evidence of contamination with the possible exception of fluoride. However, OW-4 would not be expected to show such contamination, in view of the recent start-up date of the facility.

Due to the 71-foot confining head above the aquifer in the land treatment area and the 100-foot layer of clay and shale overlying the aquifer, it is our opinion that the likelihood of contaminant migration into the near-surface aquifer from the land treatment facility is minimal. We therefore believe that the facility should be exempt from the four-well minimum monitoring requirement prescribed under RCRA.

However, we recommend that one monitor well be completed north of the land treatment area as shown on Plate 1. The well should be extended to a depth of five feet into the shale below the aquifer.

Sampling of the proposed monitor well should be on a quarterly basis and the samples should be analyzed for the same parameters listed in Section 7.1.1 for the selected existing wells.

OW-5 cannot be utilized effectively to monitor ground-water conditions in the near-surface aquifer upgradient from the land treatment

facility. Although OW-5 did penetrate the aquifer, problems developing during construction of this well resulted in the perforated casing being dislocated from the aquifer position.

RCRA regulations specify certain substantiating data which must be provided by the operator of a hazardous waste facility which justify an exemption from the monitor well requirement. These data must include an evaluation of the water balance factors (hydrologic budget) and other characteristics of the facility. Some of the required information has been provided in this report. A water balance study lies outside the present scope of work, as does an assessment of current water use down-gradient from the Ciniza Refinery.

7.2.2 Unsaturated Zone Monitoring

Paragraph 265.278 of the RCRA regulations stipulates the requirements for monitoring the unsaturated zone beneath a land treatment facility. The soils must be monitored using soil cores, and soil pore water must be monitored using devices such as lysimeters.

At least one soil core should be collected beneath the area where land treatment was first commenced. In addition, one or more soil cores should be recovered approximately midway between the oldest part of the treatment area and its active perimeter.

After the sampling site is cleaned of disturbed soil material, a shallow pit about three feet in diameter and two feet deep should be excavated and cleared of loose soil. A soil auger should then be utilized to collect one sample from three to four feet of depth and one sample from five to six feet. The pits should be backfilled with uncontaminated, low permeability soil which is compacted in place.

Due to the low permeability of these soils, core sampling more frequently than every three months appears unwarranted. The samples should be analyzed for the EP metals and total organic carbon in the same fashion as done for the present survey.

As the treated perimeter advances, new locations for taking soil cores should be selected. The locations of the coring sites should be indicated on a map of suitable scale.

Lysimeters should be utilized for sampling soil pore water, although we anticipate that collection of sufficient pore water for analysis will be difficult in the low permeability soils present under the land treatment area.

We believe that initially, two lysimeters would be sufficient. These devices would be installed at a depth of five feet in the same general locations as the coring sites. Monitoring of the lysimeters would be conducted at three-month intervals.

At about six-month intervals, if the treatment perimeter has advanced sufficiently, at least one new lysimeter installation should be emplaced and the monitoring continued according to the same schedule observed for the initial lysimeters.

Over a period of years, selected lysimeters comprising the entire network can probably be abandoned.

The procedure for installing and sampling lysimeters involves details which are not presented in this report.

As in the case of the soil cores, samples of pore water from the lysimeters should be analyzed for the EP metals and total organic carbon.

8.0 REFERENCES

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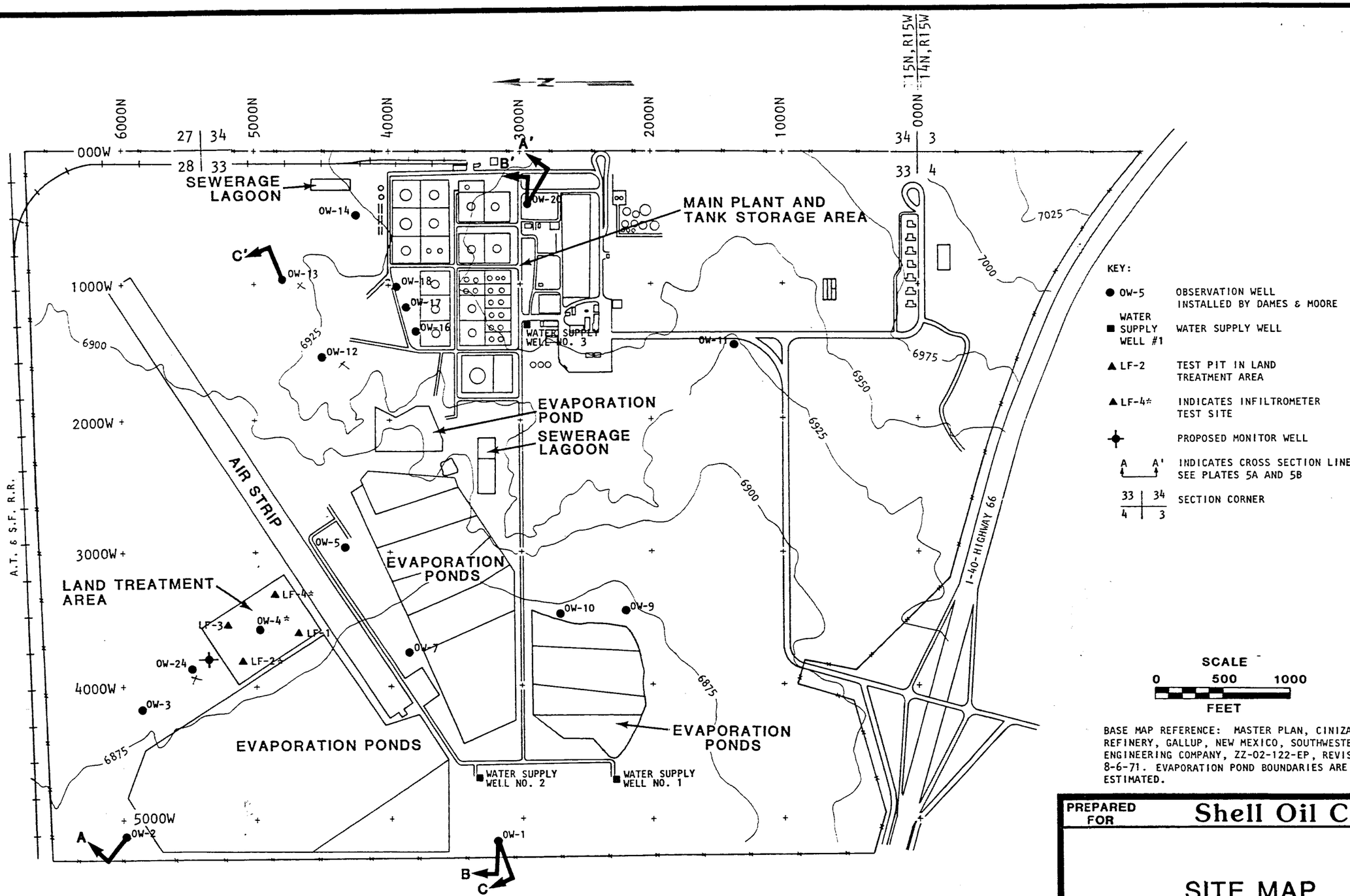
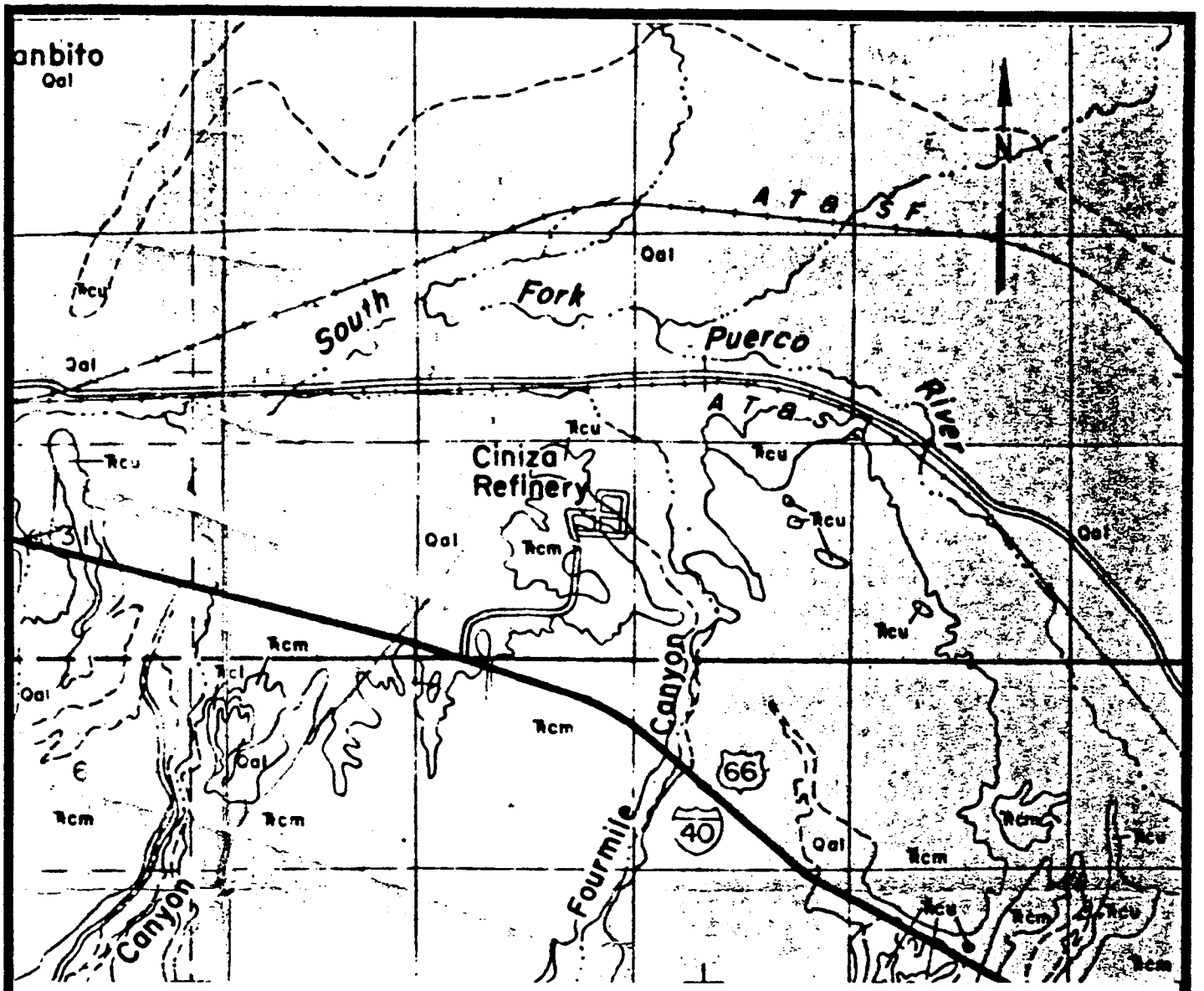


BASE MAP REFERENCE: MASTER PLAN, CINIZA REFINERY, GALLUP, NEW MEXICO, SOUTHWESTERN ENGINEERING COMPANY, ZZ-02-122-EP, REVISION 8-6-71. EVAPORATION POND BOUNDARIES ARE ESTIMATED.

PREPARED FOR **Shell Oil Co.**

SITE MAP

BY **Dames & Moore** Plate 1



Explanation:

QUATERNARY

Qal

Alluvium

Unconsolidated sand, silt, and clay with lenses of fine gravel. Yields are erratic, but can be 50 gpm or more where alluvium is thick and contains a relatively high proportion of gravel.

UPPER TRIASSIC

Ꞧcu	Ꞧcm	Ꞧcl	Ꞧcs

Chinle Formation

Ꞧcu — Rocks above Sonsela Sandstone Bed, siltstone and mudstone with coarse-grained sandstone lenses. Not known to yield water to wells within study area.

Ꞧcm — Sonsela Sandstone Bed, crossbedded sandstone and pebble conglomerate. Yields a small amount of poor-quality water to wells within study area.

Ꞧcl — Rocks between Sonsela Sandstone Bed and Shinarump Member, siltstone and mudstone. Yields a small amount of poor-quality water to wells within study area.

Ꞧcs — Shinarump Member, sandstone and conglomerate with minor claystone. Yields as much as 70 gpm of good-quality water; wells tapping the Shinarump Member generally also tap the Glorieta Sandstone.

SCALE

0 2000 4000

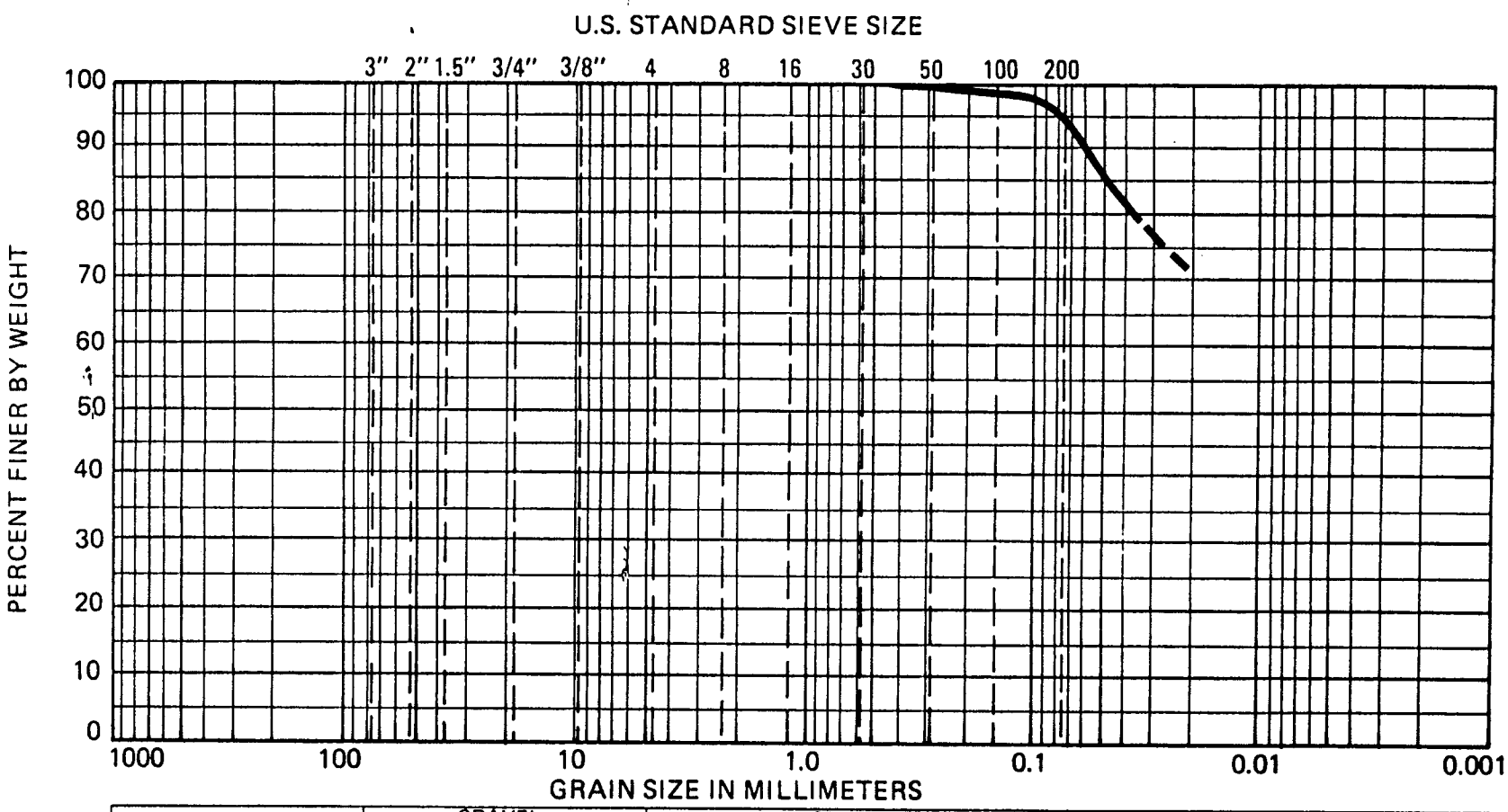
FEET

MAP REFERENCE: MODIFIED FROM SHOMAKER, 1971.

PREPARED FOR **Shell Oil Co.**

REGIONAL GEOLOGY MAP

BY **Dames & Moore** Plate 2



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

	DEPTH	CLASSIFICATION		NAT. W C	LL	PL	PI	
LF-1+LF-2 COMPOSITE	0-12"	CL	SILTY CLAY (17.0% SAND)					

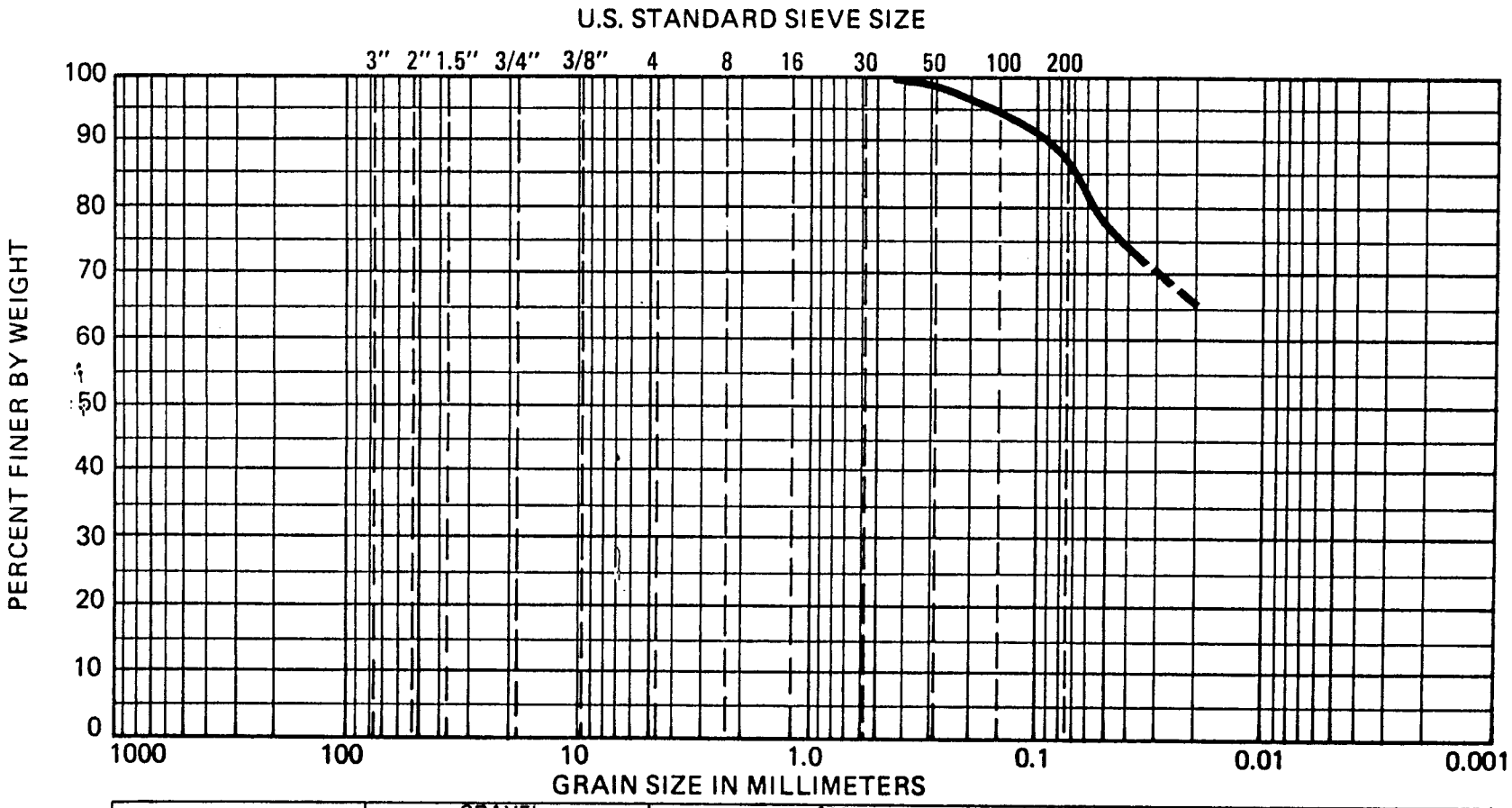
SIEVE ANALYSIS

0.2%	0.25-0.50 mm
1.0%	0.10-0.25 mm
15.8%	0.043-0.10 mm
83.0%	LESS THAN 0.043 mm

GRADATION CURVE

DAMES & MOORE

PLATE 3-A



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

	DEPTH	CLASSIFICATION		NAT. W C	LL	PL	PI	
LF-3+LF-4 +OW-4 COMPOSITE	0-12"	CL	SILTY CLAY (25.0% SAND)					

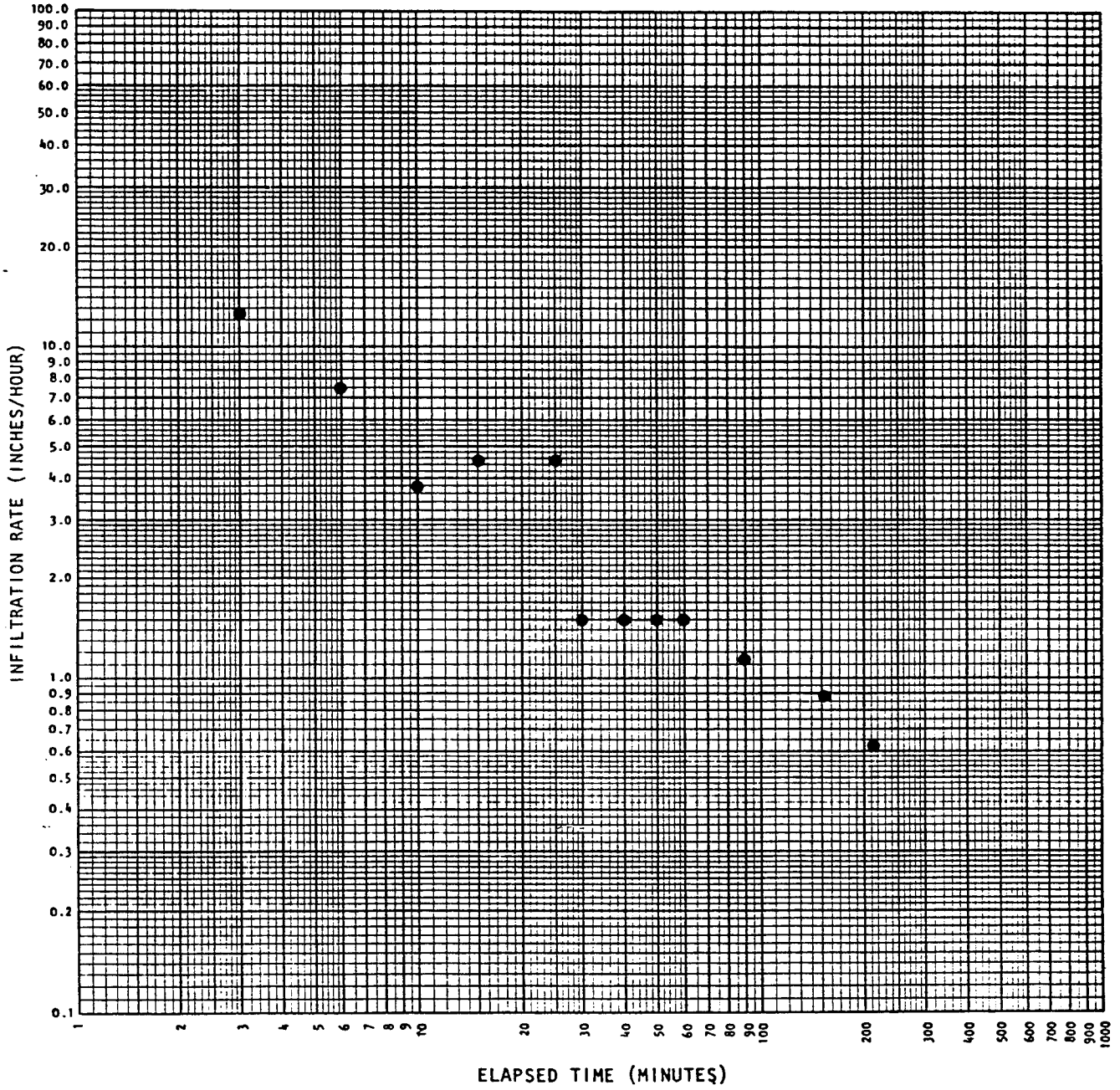
SIEVE ANALYSIS

2.4%	0.25-0.50 mm
5.7%	0.10-0.25 mm
16.9%	0.043-0.10 mm
75.0%	LESS THAN 0.043 mm

GRADATION CURVE

DAMES & MOORE

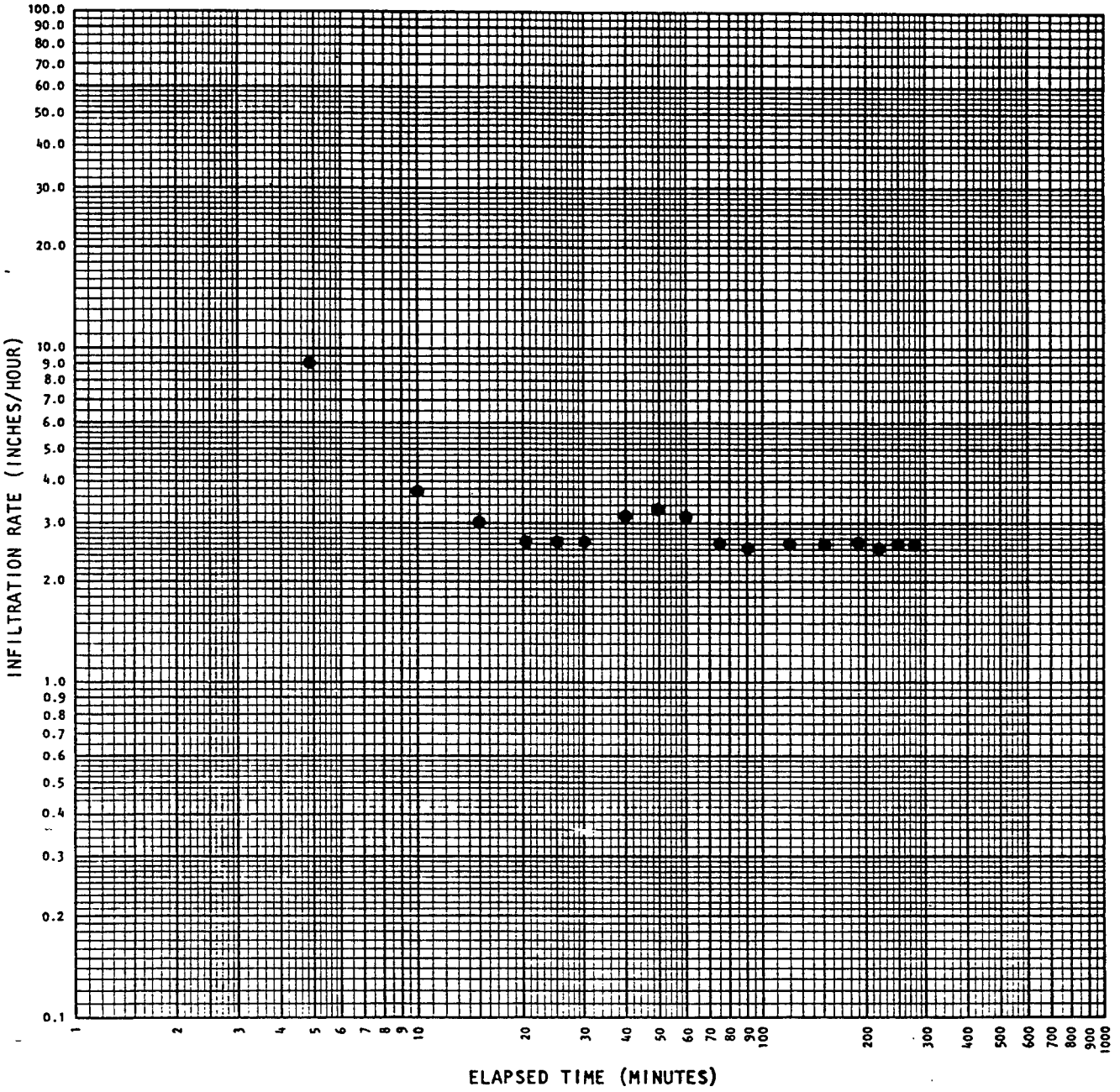
PLATE 3-B



PREPARED FOR **Shell Oil Co.**

INFILTROMETER TEST LAND TREATMENT AREA SITE LF-2

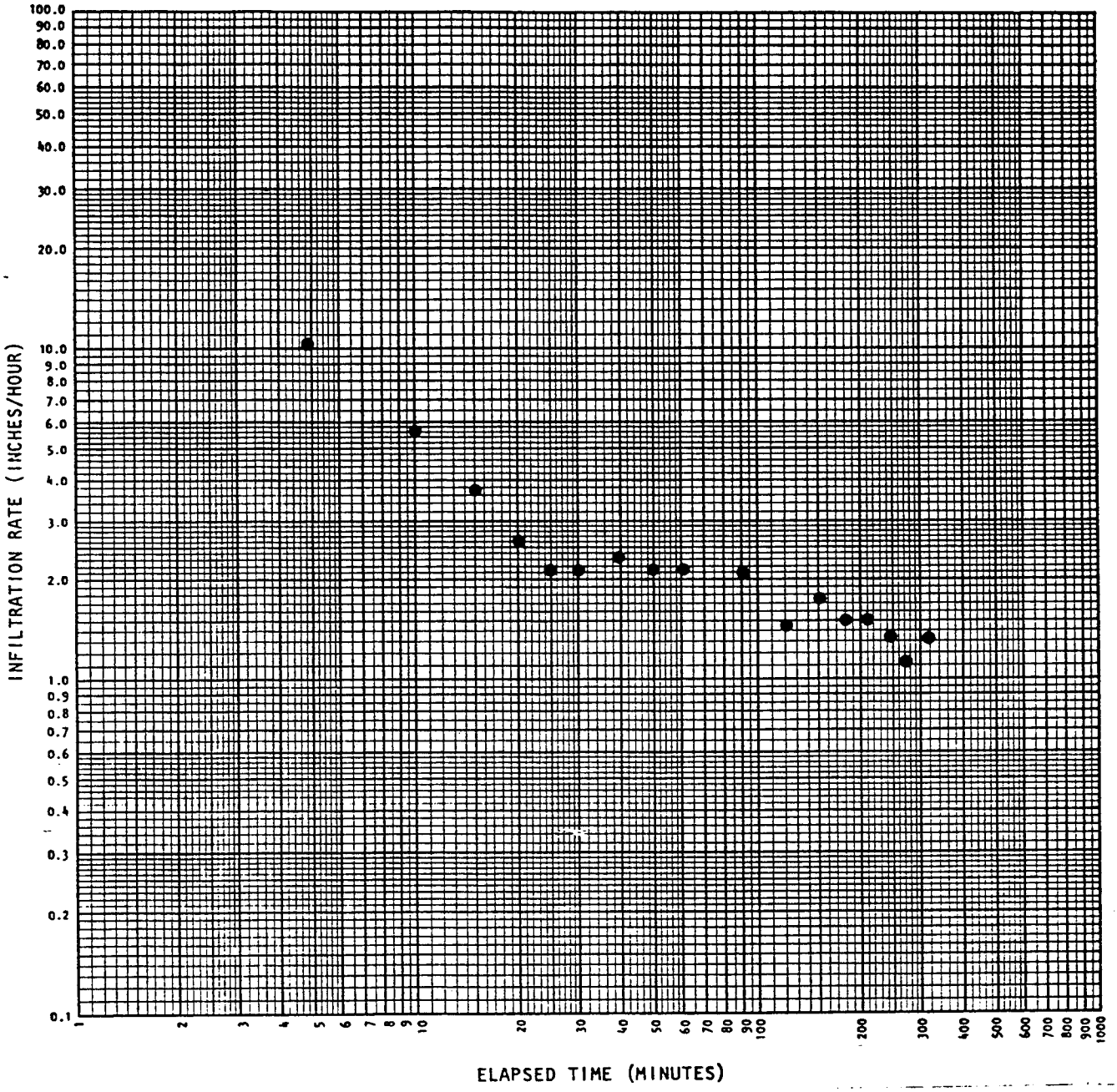
BY **Dames & Moore** Plate 4A



PREPARED FOR **Shell Oil Co.**

INFILTROMETER TEST LAND TREATMENT AREA SITE LF-4

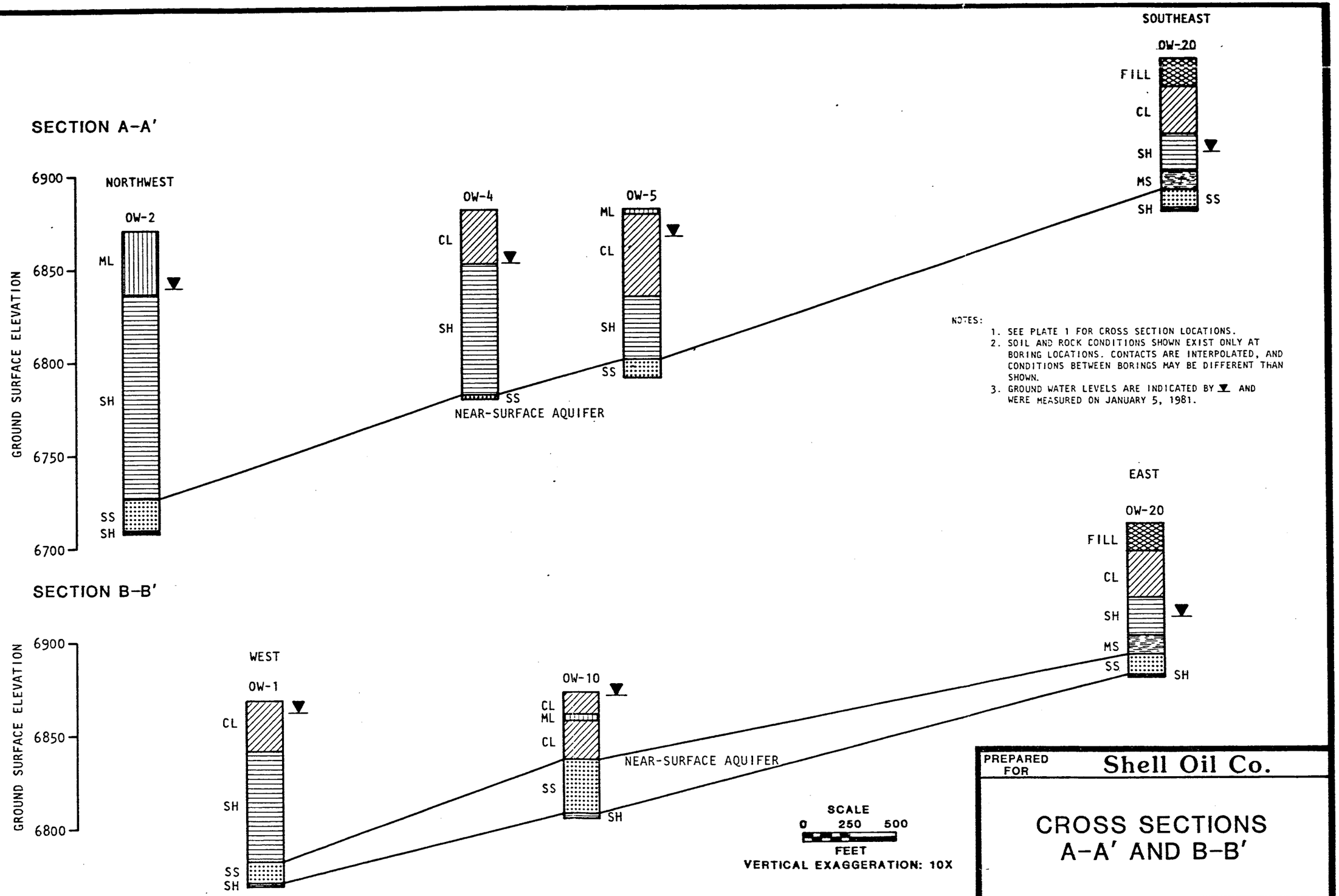
BY **Dames & Moore** Plate 4B



PREPARED FOR **Shell Oil Co.**

INFILTROMETER TEST LAND TREATMENT AREA SITE OW-4

BY **Dames & Moore** Plate 4C



NOTES:

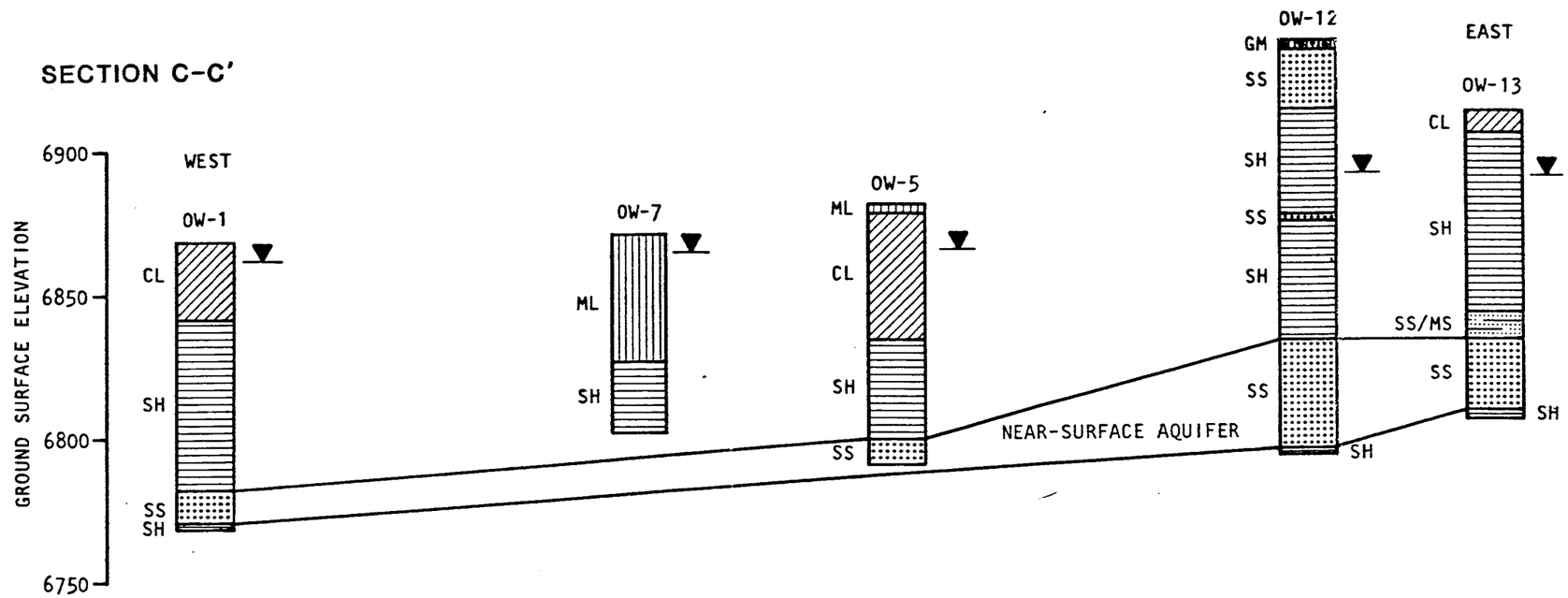
1. SEE PLATE 1 FOR CROSS SECTION LOCATIONS.
2. SOIL AND ROCK CONDITIONS SHOWN EXIST ONLY AT BORING LOCATIONS. CONTACTS ARE INTERPOLATED, AND CONDITIONS BETWEEN BORINGS MAY BE DIFFERENT THAN SHOWN.
3. GROUND WATER LEVELS ARE INDICATED BY ▼ AND WERE MEASURED ON JANUARY 5, 1981.

PREPARED FOR **Shell Oil Co.**

CROSS SECTIONS A-A' AND B-B'

BY **Dames & Moore** Plate 5A

SECTION C-C'



SCALE
0 250 500
FEET
VERTICAL EXAGGERATION: 10X

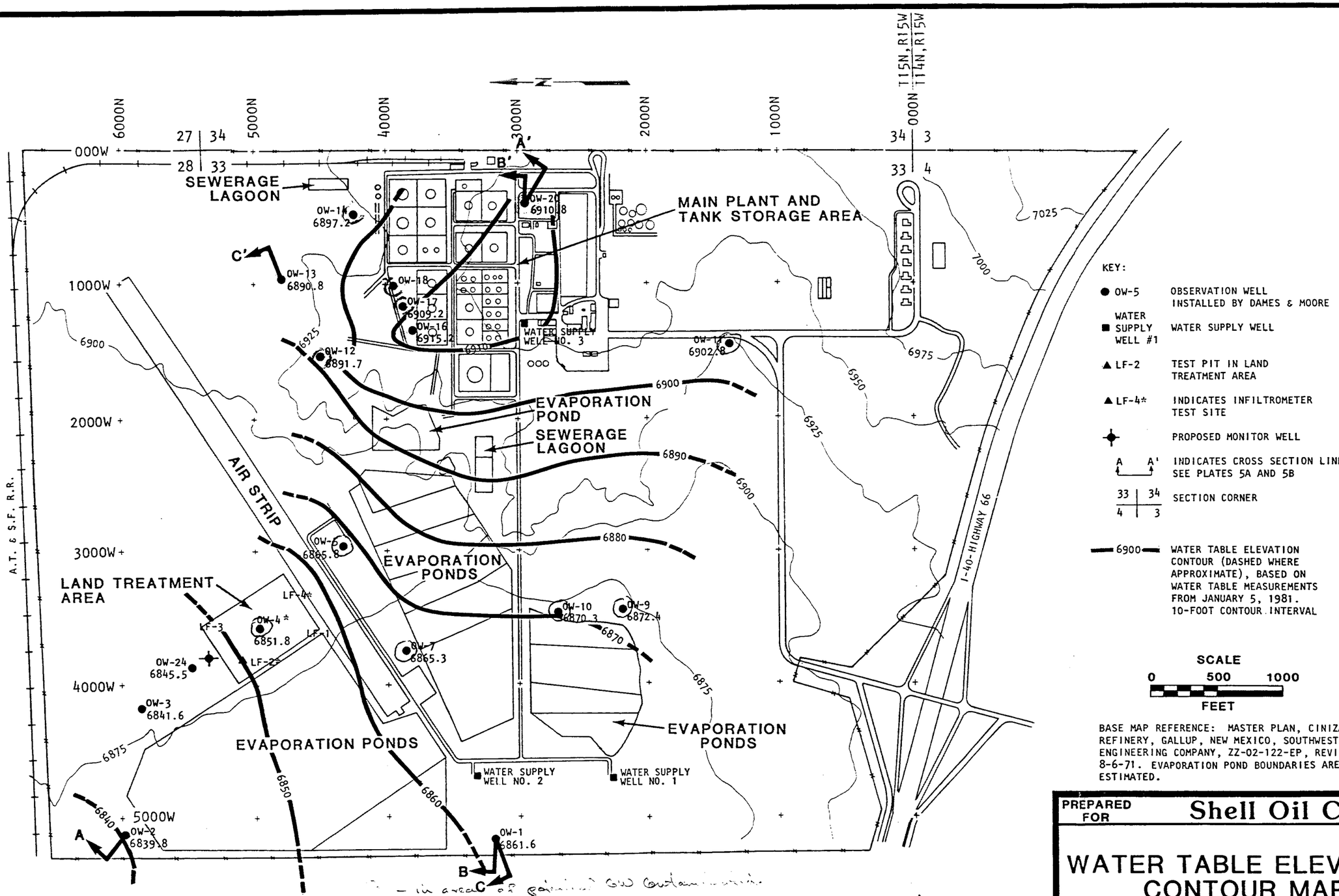
NOTES:

1. SEE PLATE 1 FOR CROSS SECTION LOCATIONS.
2. SOIL AND ROCK CONDITIONS SHOWN EXIST ONLY AT BORING LOCATIONS. CONTACTS ARE INTERPOLATED, AND CONDITIONS BETWEEN BORINGS MAY BE DIFFERENT THAN SHOWN.
3. GROUND WATER LEVELS ARE INDICATED BY ▼ AND WERE MEASURED ON JANUARY 5, 1981.

PREPARED FOR **Shell Oil Co.**

CROSS SECTION C-C'

BY **Dames & Moore** Plate 5B



KEY:

● OW-5	OBSERVATION WELL INSTALLED BY DAMES & MOORE
■ WATER SUPPLY WELL #1	WATER SUPPLY WELL
▲ LF-2	TEST PIT IN LAND TREATMENT AREA
▲ LF-4*	INDICATES INFILTROMETER TEST SITE
✦	PROPOSED MONITOR WELL
A — A'	INDICATES CROSS SECTION LINE SEE PLATES 5A AND 5B
33 | 34 / 4 | 3	SECTION CORNER
—6900—	WATER TABLE ELEVATION CONTOUR (DASHED WHERE APPROXIMATE), BASED ON WATER TABLE MEASUREMENTS FROM JANUARY 5, 1981. 10-FOOT CONTOUR INTERVAL

SCALE

0 500 1000

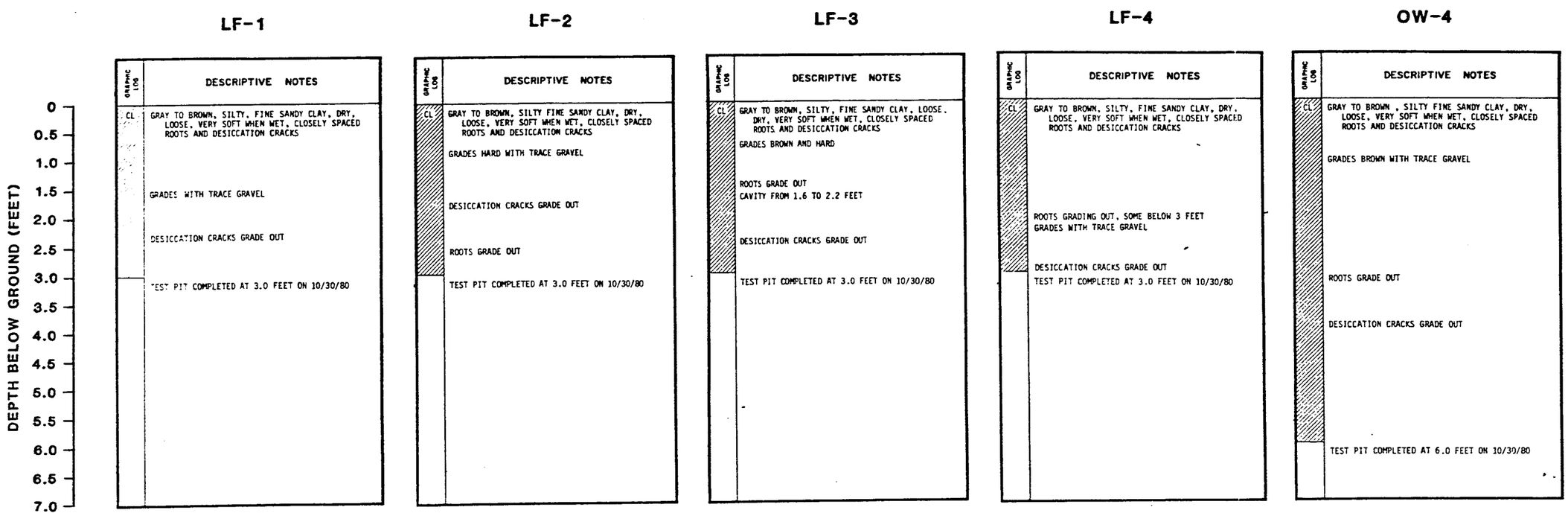
FEET

BASE MAP REFERENCE: MASTER PLAN, CINIZA REFINERY, GALLUP, NEW MEXICO, SOUTHWESTERN ENGINEERING COMPANY, ZZ-02-122-EP, REVISION 8-6-71. EVAPORATION POND BOUNDARIES ARE ESTIMATED.

PREPARED FOR **Shell Oil Co.**

WATER TABLE ELEVATION CONTOUR MAP JANUARY 5, 1981

BY **Dames & Moore** Plate 6



PREPARED FOR **Shell Oil Co.**

LAND TREATMENT AREA TEST PITS

BY **Dames & Moore** Plate A1-1

APPENDIX A-1

LOGS OF TEST PITS

APPENDIX A-2

LOGS OF

OBSERVATION WELLS

NOTE: Numerical sequence is broken because originally planned observation well sites were pre-numbered and certain of these sites were later deleted from program.

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY TO SYMBOLS ON LOG OF BORING

■ DEPTH AT WHICH UNDISTURBED SAMPLE WAS RECOVERED

⊠ DEPTH AT WHICH DISTURBED SAMPLE WAS RECOVERED

□ DEPTH AT WHICH SAMPLING ATTEMPTED WITH NO RECOVERY

CONSOL CONSOLIDATION TEST

PERM LABORATORY PERMEABILITY TEST

SG SPECIFIC GRAVITY

SIEVE SIEVE ANALYSIS

TXCUPP CONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST WITH PORE PRESSURE MEASUREMENTS

BORING OW-1

SURFACE ELEVATION: 6868 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
6.0, 5.0, 4.0, 4.2, 3.8	CL	TRIASSIC PERIOD CHINLE FORMATION RED TO REDDISH BROWN CLAY WITH TRACE TO SOME SILT, CALCAREOUS, HIGHLY WEATHERED
4.1, 5.6, 5.0, 4.2, 4.6, 5.4, 4.2, 3.6, 4.0, 5.4, 8.0	SHALE	27 FEET: SHALE, REDDISH BROWN, SILTY, CALCAREOUS, SOFT, FRESH GRADES HARD FROM 33 FEET GRADES WITH OCCASIONAL THIN LIMESTONE INTERBEDS FROM 40 TO 50 FEET GRADES WITH THIN SANDSTONE INTERBEDS FROM 45 TO 50 FEET GRADES SOFT FROM 65 FEET GRADES WITH THIN SANDSTONE AND LIMESTONE INTERBEDS FROM 75 FEET, HARD
5.2, 4.2, 3.6	SS	86 FEET: SANDSTONE, VARIEGATED BROWN TO LIGHT GRAY, FINE GRAINED, SILTY, SOFT, WITH ROUNDED TO SUBROUNDED, CLEAR TO FROSTED QUARTZ GRAINS, MICACEOUS, FRESH
		SHALE 98 FEET: SHALE, REDDISH BROWN, SILTY, SOFT, FRESH

BORING COMPLETED AT 99.3 FEET ON 11/10/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 89.3 TO 99.3 FEET.
GRAVEL PLACED FROM 88.0 TO 99.3 FEET AND SEALED WITH CEMENT AND BENTONITE TO SURFACE.
GROUND WATER LEVEL MEASURED AT 6.4 FEET BELOW GROUND ON 1/5/81.

KEY TO BORINGS
ROCK SYMBOLS

SHALE SANDSTONE MUDSTONE

NOTES:
1. PENETRATION RATE IN MINUTES PER FOOT WAS DETERMINED BY THE TIME REQUIRED TO DRILL EACH INTERVAL SHOWN WITH A CABLE TOOL RIG.
2. ESTIMATES OF SOIL CONSISTENCY AND ROCK STRENGTH ARE BASED ON PENETRATION RATE USING THE FOLLOWING CRITERIA:
   $<$ 4.2 MIN./FT.-SOFT
   $>$ 4.2 MIN./FT.-HARD
3. ELEVATION GIVEN IN FEET ABOVE MEAN SEA LEVEL.
4. SOIL CLASSIFICATION IS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM (PLATE A2-1).
5. ALL DEPTHS REFER TO DEPTH BELOW GROUND.
6. SEE PLATE 1 FOR LOCATION OF WELLS.

LOG OF BORINGS

DAMES & MOORE

BORING OW-2

SURFACE ELEVATION: 6871 FEET

LABORATORY TEST DATA

DEPTH IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

SYMBOLS

DESCRIPTION

ML — TRIASSIC PERIOD
CHINLE FORMATION
REDDISH BROWN SILTY CLAY, SOFT, HIGHLY WEATHERED

1.8
2.0
3.0

SHALE — 34 FEET: SHALE, REDDISH BROWN, SILTY, CALCAREOUS, SOFT, FRESH

4.0
2.4
3.5

GRADES BROWN FROM 50 FEET

1.9
2.0

GRADES WITH SOME FINE SAND FROM 58 FEET

1.4
2.0

SILT AND FINE SAND GRADES OUT FROM 70 FEET

1.4

GRADES DARK GRAY FROM 75 FEET

1.0

GRADES WITH TRACE TO SOME SILT FROM 80 FEET

2.3
2.5

SHALE — 83 FEET: SHALE, DARK BROWN TO BLACK, WITH SOME SAND AND GRAVEL-SIZED FRAGMENTS OF PETRIFIED WOOD, HARD

10.0
7.8

GRADES GRAY FROM 88 FEET

11.2
7.5

GRADES PURPLE TO GRAY FROM 100 FEET

7.0
5.0

GRADES SOFT FROM 110 FEET

3.4
4.4
5.0

GRADES HARD FROM 120 TO 125 FEET

GRADES REDDISH BROWN FROM 125 FEET, SOFT

3.8

GRADES HARD FROM 130 FEET

5.0
5.4

GRADES TO PURPLE AND REDDISH BROWN FROM 135 FEET

5.0

SS — 143 FEET: SANDSTONE, BROWN, FINE-GRAINED, SUB-ANGULAR, CALCAREOUS, WELL SORTED, SOFT

4.0

SHALE
162.5 FEET: SHALE, PURPLE TO REDDISH BROWN, WITH SOME SILT, HARD

3.6

BORING COMPLETED AT 163.0 FEET ON 10/31/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 48.0 TO 68.0 FEET.
GRAVEL PLACED FROM 43.0 TO 68.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 31.2 FEET BELOW GROUND 1/5/81.

4.4
5.0

LOG OF BORINGS

DAMES & MOORE

BORING OW-3

SURFACE ELEVATION: 6876 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
1.2	CL	TRIASSIC PERIOD
		CHINLE FORMATION
1.8		REDDISH BROWN CLAY WITH SOME FINE SAND, SOFT, HIGHLY WEATHERED
2.2		
		GRADES WITH SILT FROM 15 FEET
1.6		
2.0		
		FINE SAND GRADES OUT FROM 25 FEET
3.2	SHALE	28 FEET: SHALE, RED TO REDDISH BROWN, SILTY, CALCAREOUS, HARD, FRESH
5.0		
		GRADES SOFT FROM 35 FEET
4.0		
4.4		
4.0		
		GRADES WITH SOME FINE SAND FROM 50 FEET
2.6		
1.4		
1.0		
2.5		

BORING COMPLETED AT 67.0 FEET ON 11/4/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 47.0 TO 67.0 FEET.
GRAVEL PLACED FROM 36.0 TO 67.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 34.4 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-4

SURFACE ELEVATION: 6881 FEET

LABORATORY TEST DATA

DEPTH IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
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30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
2.0, 2.4, 3.0, 2.8, 3.4, 4.0	CL	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY CLAY, SOFT, HIGHLY WEATHERED GRADES WITH SOME FINE SAND FROM 15 FEET
5.0, 4.4, 5.0, 5.4, 5.0, 12.2, 7.0, 8.0, 5.0, 6.0, 6.4, 5.4, 5.0, 4.4	SHALE	28 FEET: SHALE, REDDISH BROWN, SILTY, WITH SOME FINE-GRAINED SAND, CALCAREOUS, HARD, FRESH GRADES GRAY FROM 60 FEET GRADES WITH THIN LIMESTONE INTERBEDS FROM 85 TO 100 FEET
17.5	SS	100 FEET: SANDSTONE, LIGHT TO DARK BROWN, FINE-GRAINED, HARD, FRESH

BORING COMPLETED AT 102.0 FEET ON 11/7/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 62.0 TO 102.0 FEET.
GRAVEL PLACED FROM 62.0 TO 102.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 29.2 FEET BELOW GROUND ON 1/5/81.

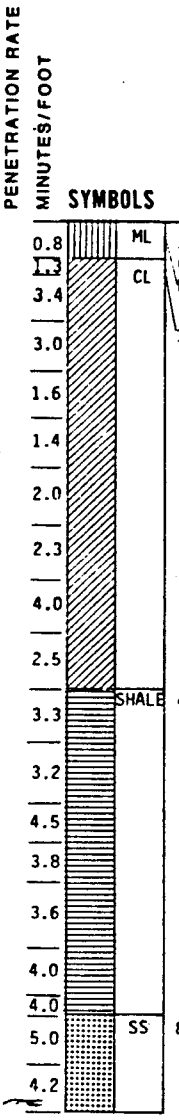
LOG OF BORINGS

DAMES & MOORE

BORING OW-5

SURFACE ELEVATION: 6882 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									



DESCRIPTION

TRIASSIC PERIOD

CHINLE FORMATION

BROWN TO REDDISH BROWN FINE SAND WITH SOME SILT AND CLAY, SOFT, HIGHLY WEATHERED

3.5 FEET: REDDISH BROWN SILTY CLAY, SOFT, HIGHLY WEATHERED

GRADES WITH GRAVEL-SIZED FRAGMENTS OF SANDSTONE AND LIMESTONE FROM 15 TO 25 FEET

48 FEET: SHALE, REDDISH BROWN, SILTY, WITH SOME SAND, SOFT, FRESH

GRADES WITH OCCASIONAL THIN INTERBEDS OF SANDSTONE AND LIMESTONE FROM 55 FEET

82 FEET: SANDSTONE, REDDISH BROWN, VERY FINE-GRAINED, INTERBEDS OF WHITE TO GRAY FINE GRAINED SANDSTONE, SOME MICA, SOFT, FRESH

BORING COMPLETED AT 92.0 FEET ON 11/12/80.
BORING CAVED FROM 25.3 TO 92.0 FEET.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 0 TO 25.3 FEET.
GRAVEL PLACED FROM 17.4 TO 25.3 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 16.2 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-7

SURFACE ELEVATION: 6872 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
3.2	ML	TRAISSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY CLAY WITH SOME FINE SAND, SOFT, HIGHLY WEATHERED
3.6		
4.4		GRADES HARD FROM 15 TO 30 FEET
4.8		
4.8		
4.6		GRADES WITH TRACE COARSE SAND FROM 30 TO 40 FEET
3.8		GRADES HARD FROM 35 FEET
5.0		
4.4	SHALE	44 FEET: SHALE, RED, WITH SOME SAND AND SILT, HARD, FRESH
5.6		
6.0		GRADES WITH OCCASIONAL THIN LIMESTONE INTERBEDS FROM 55 FEET
7.0		
6.2		
6.6		

BORING COMPLETED AT 70.0 FEET ON 11/18/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 50.0 TO 70.0 FEET.
GRAVEL PLACED FROM 45.0 TO 70.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 6.7 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

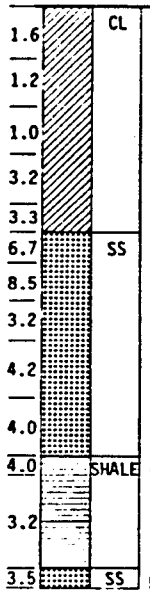
BORING OW-9

SURFACE ELEVATION: 6873 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

SYMBOLS



DESCRIPTION

TRIASSIC PERIOD

CHINLE FORMATION

REDDISH BROWN SILTY CLAY, SOFT, HIGHLY WEATHERED
GRADES GRAY FROM 6 FEET

23 FEET: SANDSTONE, BROWN, FINE-TO COARSE-GRAINED, WITH GRAVEL-SIZED FRAGMENTS OF LIMESTONE AND CHERT, CLEAR TO FROSTED QUARTZ GRAINS, HARD, FRESH

GRADES SOFT FROM 30 FEET

GRADES GRAYISH BROWN FROM 40 FEET

46 FEET: SHALE, GRAY, SANDY (FINE-GRAINED) WITH OCCASIONAL THIN INTERBEDS OF LIMESTONE, SOFT, FRESH

58 FEET: SANDSTONE, REDDISH BROWN, FINE-GRAINED, THIN LAYERED, SOFT, FRESH

BORING COMPLETED AT 60.0 FEET ON 11/21/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 23.0 TO 43.0 FEET.
GRAVEL PLACED FROM 19.0 TO 60.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 0.6 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

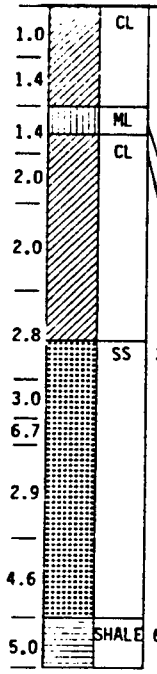
BORING OW-10

SURFACE ELEVATION: 6872 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

SYMBOLS



DESCRIPTION

TRIASSIC PERIOD

CHINLE FORMATION

REDDISH BROWN SILTY CLAY, SOFT, HIGHLY WEATHERED

GRADES WITH TRACE TO SOME MEDIUM TO FINE-GRAINED SAND-SIZED PARTICLES OF CHERT, PETRIFIED WOOD, AND LIMESTONE FROM 5 FEET

10 FEET: REDDISH BROWN SILTY FINE-GRAINED SAND, WITH SOME CLAY, SOFT, HIGHLY WEATHERED

13 FEET: REDDISH BROWN SILTY CLAY WITH SOME SAND, SOFT, HIGHLY WEATHERED

SAND GRADES OUT FROM 16 FEET

GRADES WITH SAND FROM 24 FEET

GRADES WITH OCCASIONAL THIN INTERBEDS OF SANDSTONE FROM 28 FEET

34 FEET: SANDSTONE, COLOR VARIES FROM DARK AND REDDISH BROWN TO WHITE TO LIGHT GRAY, SILTY, FINE-GRAINED, NONCALCAREOUS, SOFT, FRESH

GRADES BROWN FROM 45 FEET

63 FEET: SHALE, GRAY TO PURPLISH GRAY, SILTY, WITH OCCASIONAL THIN INTERBEDS OF TAN TO BROWN, FINE-GRAINED, CALCAREOUS SANDSTONE, HARD, FRESH

BORING COMPLETED AT 68.0 FEET ON 11/25/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 40.0 TO 60.0 FEET.
GRAVEL PLACED FROM 36.0 TO 68.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 1.7 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-11

SURFACE ELEVATION: 6923 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT: 1.6, 1.4, 2.4, 3.0, 6.5, 2.4, 12.5, 4.4, 5.5, 4.0, 3.1, 4.3, 5.0, 8.0, 2.5, 3.3, 4.0, 2.3, 3.6, 2.3, 4.3, 4.5, 2.7, 3.0, 3.5, 4.0, 4.3, 3.5, 3.3, 4.5, 2.7, 4.5, 2.0, 6.5, 5.0, 2.3, 2.3, 2.7, 3.0, 2.2, 2.3, 2.2, 2.7, 3.3, 2.7, 2.2

SYMBOLS	DESCRIPTION
SM	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY FINE SAND, SOFT, HIGHLY WEATHERED GRADES WITH GRAVEL-SIZED FRAGMENTS OF FINE SANDSTONE AND LIMESTONE FROM 7 FEET
SHALE	13 FEET: SHALE, GRAY, SILTY, WITH OCCASIONAL THIN INTERBEDS OF WHITE SANDSTONE, SOFT, FRESH GRADES WITH REDDISH BROWN SANDSTONE INTERBEDS FROM 20 FEET GRADES WITH LAYER OF WHITE, FINE-GRAINED SANDSTONE FROM 23 TO 24 FEET
SS	30 FEET: SANDSTONE, WHITE, FINE-GRAINED, WITH GRAVEL-SIZED FRAGMENTS OF CHERT, OCCASIONAL THIN INTERBEDS OF REDDISH BROWN FINE-GRAINED SANDSTONE, THINLY BEDDED, HARD, FRESH
SHALE	40 FEET: SHALE, GRAY TO PURPLE, SILTY AND SANDY, SOFT, FRESH GRADES WITH SOME SAND FROM 47 FEET GRADES GRAY AND HARD FROM 50 TO 55 FEET GRADES WHITE TO LIGHT GRAY FROM 55 FEET, SOFT GRADES PURPLE FROM 68 FEET GRADES GRAY FROM 78 FEET GRADES WITH OCCASIONAL THIN INTERBEDS OF LIMESTONE AND GRAVEL-SIZED FRAGMENTS OF CHERT FROM 92 FEET GRADES REDDISH BROWN FROM 103 FEET GRADES GRAY AND HARD FROM 110 FEET GRADES SOFT WITH NO INTERBEDS FROM 114 FEET GRADES PURPLISH GRAY FROM 117 FEET GRADES GRAY FROM 140 FEET

BORING COMPLETED AT 150.0 FEET ON 12/30/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 43.0 TO 65.0 FEET.
GRAVEL PLACED FROM 35.0 TO 65.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 20.2 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-12

SURFACE ELEVATION: 6939 FEET

LABORATORY TEST DATA

DEPTH IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
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60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

Penetration rate (minutes/foot)	Symbols	DESCRIPTION
3.3	GM	TRIASSIC PERIOD
6.4	SS	CHINLE FORMATION LIGHT BROWN FINE SAND WITH GRAVEL-SIZED FRAGMENTS OF CHERT, LIMESTONE, AND PETRIFIED WOOD, SOFT, HIGHLY WEATHERED
6.4		3 FEET: SANDSTONE, LIGHT BROWN, FINE-GRAINED WITH SOME MEDIUM TO COARSE GRAINS, COMPOSED OF QUARTZ WITH MINOR CHERT AND LIMESTONE, HARD, FRESH
4.0		
15.0		GRADES SOFT FROM 17 FEET
7.5		GRADES HARD FROM 20 TO 24 FEET
3.8	SHALE	24 FEET: SHALE, REDDISH BROWN, SILTY, SANDY, WITH GRAVEL-SIZED FRAGMENTS OF PETRIFIED WOOD AND LIMESTONE, SOFT, FRESH
6.2		
6.7		GRADES HARD FROM 29 FEET
5.0		GRADES SOFT FROM 40 FEET
3.0		
3.0		GRADES HARD FROM 49 FEET
4.2		
4.4		
6.3	SS	61 FEET: SANDSTONE, GRAY, SILTY, FINE-TO MEDIUM-GRAINED, CALCAREOUS, HARD, FRESH
3.5	SHALE	64 FEET: SHALE, GRAY, SILTY, SANDY, SOFT, FRESH
3.3		
3.3		
3.4		
3.6		
3.4		GRADES HARD FROM 90 FEET
5.3		
5.0		
4.3		
5.0	SS	104 FEET: SANDSTONE, GRAY TO BLUISH GRAY, FINE-GRAINED, THINLY BEDDED, NONCALCAREOUS, WITH INTERBEDDED REDDISH BROWN SANDY MUDSTONE, HARD, FRESH
5.6		GRADES BROWN FROM 112 FEET
4.8		
4.0		
5.0		
4.3		
5.0		
8.3		
5.0	SHALE	143 FEET: SHALE, GRAY, SILTY, SANDY, HARD, FRESH

BORING COMPLETED AT 145.0 FEET ON 12/15/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 117.8 TO 137.8 FEET.
GRAVEL PLACED FROM 105.0 TO 137.8 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 47.3 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-13

SURFACE ELEVATION: 6914 FEET

LABORATORY TEST DATA

DEPTH IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
1.4	CL	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY FINE SANDY CLAY, SOFT, HIGHLY WEATHERED
2.6	SHALE	GRADES WITH GRAVEL FROM 3 TO 6 FEET 8 FEET: SHALE, REDDISH BROWN, SILTY WITH SOME FINE SAND, SOFT, FRESH
3.6		
4.0		
3.0		
3.0		GRADES WITH THIN LIMESTONE INTERBEDS FROM 26 TO 32 FEET
3.3		
4.4		GRADES GRAY AND HARD FROM 40 FEET
4.8		
4.6		GRADES REDDISH BROWN FROM 55 FEET
4.0		
4.3		
7.5		
6.7		
5.0		
6.5	SS/MS	70 FEET: SANDSTONE, WHITE TO GRAY, FINE-GRAINED, INTERBEDDED WITH REDDISH BROWN SANDY MUDSTONE, THIN BEDDED, HARD, FRESH
6.7		
6.0		
5.0	SS	79 FEET: SANDSTONE, LIGHT BROWN, FINE-GRAINED WITH SOME MEDIUM TO COARSE GRAINS, SLIGHTLY CALCAREOUS, COMPOSED OF QUARTZ WITH MINOR LIMESTONE, HARD, FRESH
6.0		
5.7		
10.0		
8.0		
6.4	SHALE	104 FEET: SHALE, REDDISH BROWN, SANDY, WITH OCCASIONAL THIN INTERBEDS OF SANDSTONE AND LIMESTONE, HARD, FRESH

BORING COMPLETED AT 108.0 FEET ON 12/10/80.
BORING ALLOWED TO CAVE FROM 98.2 TO 104.0 FEET.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 78.2 TO 98.2 FEET.
GRAVEL PLACED FROM 74.0 TO 98.2 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 23.2 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-14

SURFACE ELEVATION: 6923 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
2.0, 1.7, 1.6, 1.7, 2.6	CL	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY, FINE SANDY CLAY, CALCAREOUS, SOFT, HIGHLY WEATHERED
2.2, 2.6, 2.4	SM	24 FEET: REDDISH BROWN SILTY, VERY FINE SAND, SOFT, HIGHLY WEATHERED
5.0, 4.0	SS	39 FEET: SANDSTONE, BROWN, FINE-TO COARSE-GRAINED SILTY, WITH OCCASIONAL THIN INTERBEDS OF LIMESTONE, HARD, FRESH

BORING COMPLETED AT 45.0 FEET ON 12/17/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 35.0 TO 45.0 FEET.
GRAVEL PLACED FROM 30.0 TO 45.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 25.8 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

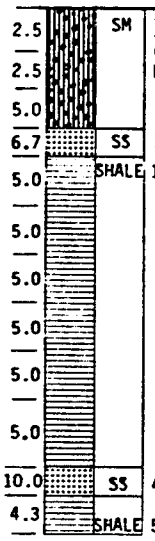
BORING OW-16

SURFACE ELEVATION: 6942 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

SYMBOLS



DESCRIPTION

TRIASSIC PERIOD

CHINLE FORMATION
REDDISH BROWN SILTY FINE SAND WITH SOME GRAVEL, SOFT, HIGHLY WEATHERED

12 FEET: SANDSTONE, RED, FINE-GRAINED, HARD, FRESH

15 FEET: SHALE, RED, SANDY, HARD, FRESH

47 FEET: SANDSTONE, GRAY, FINE-TO MEDIUM-GRAINED, CALCAREOUS, HARD, FRESH

50 FEET: SHALE, GRAY, SILTY, WITH SOME FINE SAND, HARD, FRESH

BORING COMPLETED AT 54.6 FEET ON 12/2/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 44.6 TO 54.6 FEET.
GRAVEL PLACED FROM 36.0 TO 54.6 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 26.8 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

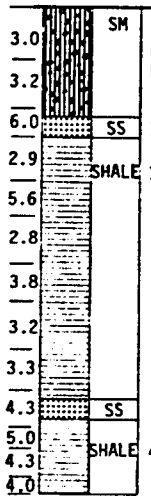
BORING OW-17

SURFACE ELEVATION: 6941 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

SYMBOLS



DESCRIPTION

TRIASSIC PERIOD

CHINLE FORMATION

REDDISH BROWN SILTY FINE SAND WITH SOME GRAVEL-SIZED FRAGMENTS OF LIMESTONE AND SANDSTONE, SOFT, HIGHLY WEATHERED

11 FEET: SANDSTONE, REDDISH BROWN, FINE-GRAINED, NONCALCAREOUS, HARD, FRESH

13 FEET: SHALE, REDDISH BROWN, SANDY, SOFT, FRESH

GRADES HARD FROM 27.5 TO 30.0 FEET

GRADES GRAY FROM 31 FEET

GRADES WITH THIN LIMESTONE AND SANDSTONE INTERBEDS FROM 39 FEET

40 FEET: SANDSTONE, GRAY, FINE-GRAINED, SILTY, CALCAREOUS, HARD, FRESH

42 FEET: SHALE, GRAY, SILTY, SANDY, WITH SOME GRAVEL-SIZED FRAGMENTS OF CHERT AND LIMESTONE AND OCCASIONAL THIN INTERBEDS OF LIMESTONE, HARD, FRESH

BORING COMPLETED AT 50.0 FEET ON 1/3/81.

4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 38.0 TO 50.0 FEET.

GRAVEL PLACED FROM 24.0 TO 50.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.

GROUND WATER LEVEL MEASURED AT 31.8 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-18

SURFACE ELEVATION: 6932 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

PENETRATION RATE (MINUTES/FOOT)	SYMBOLS	DESCRIPTION
0.7, 1.0, 1.2, 1.7	SM	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN SILTY FINE SAND, SOFT, HIGHLY WEATHERED
3.0, 3.2, 6.0, 3.0, 4.8, 4.0, 4.0	SHALE	17 FEET: SHALE, REDDISH BROWN, SANDY, WITH SOME GRAVEL-SIZED FRAGMENTS OF CHERT AND PETRIFIED WOOD, OCCASIONAL THIN INTERBEDS OF LIMESTONE AND SANDSTONE, SOFT, FRESH GRADES HARD FROM 30 TO 32 FEET GRADES GRAY FROM 32 FEET GRADES HARD FROM 37 TO 41 FEET
3.0, 2.9	SS	SS 0.5 FOOT LAYER OF FINE-GRAINED, BROWN, CALCAREOUS SANDSTONE FROM 49 FEET
6.3, 3.0, 2.8, 3.6	SS	61 FEET: SANDSTONE, BROWN, FINE-GRAINED, THIN BEDDED WITH OCCASIONAL THIN INTERBEDS OF BLUISH GRAY MUDSTONE, NONCALCAREOUS, HARD, FRESH MUDSTONE INTERBEDS GRADE OUT FROM 65 FEET, GRADES SOFT

BORING COMPLETED AT 82.0 FEET ON 12/4/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 72.0 TO 82.0 FEET.
GRAVEL PLACED FROM 67.0 TO 82.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 27.0 FEET BELOW GROUND ON 12/5/80.

LOG OF BORINGS

DAMES & MOORE

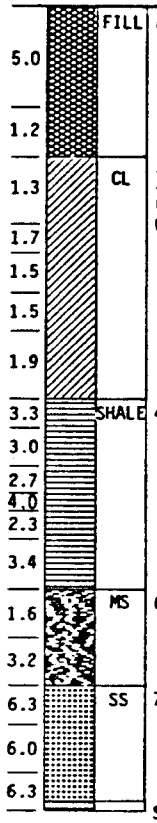
BORING OW-20

SURFACE ELEVATION: 6961 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT

SYMBOLS



DESCRIPTION

FILL

TRIASSIC PERIOD

CHINLE FORMATION

GRAY SILTY, FINE SANDY CLAY, SOFT, HIGHLY WEATHERED

GRADES WITH SOME GRAVEL-SIZED FRAGMENTS OF LIMESTONE FROM 29 FEET

40 FEET: SHALE, REDDISH BROWN, SILTY, WITH SOME FINE SAND, AND OCCASIONAL THIN INTERBEDS OF SANDSTONE AND LIMESTONE, SOFT, FRESH

60 FEET: MUDSTONE, REDDISH BROWN, INTERBEDDED WITH LAMINAE OF WHITE TO LIGHT BROWN SANDSTONE, SOFT, FRESH

70 FEET: SANDSTONE, BROWN, COARSE-GRAINED, COMPOSED OF QUARTZ WITH MINOR CHERT, AND LIMESTONE, HARD, FRESH

SHALE

82 FEET: SHALE, GRAY, SILTY WITH SOME FINE SAND, HARD, FRESH

BORING COMPLETED AT 83.0 FEET ON 12/19/80.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 54.0 TO 64.0 FEET.
GRAVEL PLACED FROM 50.0 TO 64.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 50.2 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

BORING OW-24

SURFACE ELEVATION: 6878 FEET

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
2.4	CL	TRIASSIC PERIOD CHINLE FORMATION REDDISH BROWN, VERY FINE SANDY CLAY, SOFT, HIGHLY WEATHERED
2.0		
2.0		
1.6		
2.0		
1.8		
2.3	SHALE	30 FEET: SHALE, REDDISH BROWN, SANDY, SOFT, FRESH
1.8		
2.3		
3.5		
3.3		
4.0		
3.7		
4.0		
2.0		
3.0		
2.3		
2.4		

BORING COMPLETED AT 65.0 FEET ON 1/2/81.
4-INCH PVC PIEZOMETER INSTALLED WITH PERFORATIONS FROM 41.0 TO 61.0 FEET.
GRAVEL PLACED FROM 28.0 TO 61.0 FEET AND BORING SEALED WITH BENTONITE AND CEMENT TO SURFACE.
GROUND WATER LEVEL MEASURED AT 32.5 FEET BELOW GROUND ON 1/5/81.

LOG OF BORINGS

DAMES & MOORE

APPENDIX B-1

SOILS IN LAND TREATMENT AREA

E P TOXICITY

CUSTOMER Dames and Moore
ADDRESS Suite 398W, City Center
CITY 6400 Uptown Blvd., N.E.
ATTENTION Albuquerque, NM 87110
INVOICE NO. Bill Mead
012050

REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
LF-1 0-1 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	0.002
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	< 0.001
	Mercury	< 0.0004
	pH	8.6
	Selenium	0.01
	Silver	< 0.01
	Total Organic Carbon	4800 ug/gm

APPROVED BY

Elmer D. Martinez, Operations Division, Mgr.

12/11/80 PAGE 1 OF 19 PAGE

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics) "Corrected Report"

Sample Identification	Type of Analysis		mg/liter
LF-1 1-2 ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium		0.001
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead		0.003
	Mercury	<	0.0004
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4700 ug/gm

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Elmer D. Martinez, Operations Division, Mgr
12/11/80

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics) "Corrected Report"

Sample Identification	Type of Analysis		mg/liter
LF-1 2-3 ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium		0.001
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead		0.002
	Mercury	<	0.0004
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4700 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis		mg/liter
LF-2 0-1 Ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium		0.001
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead		0.001
	Mercury	<	0.0004
	pH		8.4
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4800 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics) "Corrected Report"

Sample Identification	Type of Analysis	mg/liter
LF-2 1-2 ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	0.002
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	< 0.001
	Mercury	< 0.0004
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4700 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
LF-2 2-3 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	< 0.001
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	0.002
	Mercury	< 0.0004
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4700 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics) "Corrected Report"

Sample Identification	Type of Analysis		mg/liter
LF-3 0-1 ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium		0.002
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead	<	0.001
	Mercury	<	0.0004
	pH		8.9
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4700 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis		mg/liter
LF-3 1-2 Ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium		0.002
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead	<	0.001
	Mercury	<	0.0004
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4700 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
LF-3 2-3 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	0.002
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	0.001
	Mercury	< 0.0004
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4800 ug/gm

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
LF-4 0-1 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	0.001
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	< 0.001
	Mercury	< 0.0004
	pH	8.7
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4800 ug/gm

APPROVED BY
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12/11/80

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
LF-4 1-2 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	< 0.001
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	< 0.001
	Mercury	< 0.0004
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4700 ug/gm

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Elmer D. Martinez, Operations Division, Mgr.
12/11/80

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics) "Corrected Report"

Sample Identification	Type of Analysis		mg/liter
LF-4 2-3 ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium		0.002
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead		0.002
	Mercury	<	0.0004
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4700 ug/gm

APPROVED BY
Elmer D. Martinez, Operations Division, Mgr.
12/11/80

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INVOICE NO. Bill Mead
012050

REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
OW-4 0-1 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	0.001
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	0.003
	Mercury	< 0.0004
	pH	8.5
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4800 ug/gm

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12/11/80 PAGE 5 OF 19 PAGE

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CITY 6400 Uptown Blvd., N.E.
ATTENTION Albuquerque, NM 87110
INVOICE NO. Bill Mead
012050

REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis	mg/liter
OW-4 1-2 Ft.	Arsenic	< 0.01
	Barium	< 10
	Cadmium	< 0.001
	Chromium	< 0.001
	Chromium 6+	< 0.01
	Lead	0.003
	Mercury	< 0.0004
	Selenium	< 0.01
	Silver	< 0.01
	Total Organic Carbon	4700 ug/gm

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12/11/80 PAGE 10 OF 19 PAGE

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Telephone 505/982-9841

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ADDRESS 6400 Uptown Blvd. NE Suite 398W
CITY City Center
TENTION Albuquerque, NM 87110
ICE NO. William Mead
101057

REPORT OF ANALYSIS

SAMPLES RECEIVED

CUSTOMER ORDER NUMBER

PE OF ANALYSIS Soil

CORRECTED COPY

Sample Identification	Type of Analysis	ug/g
LF-2 1-2 ft.	Arsenic, Total	50
	Barium, Total	1,100
	Cadmium, Total	0.3
	Chromium, Total	39
	Chromium 6+, Total	1
	Lead, Total	26
	Mercury, Total	0.1
	Selenium, Total	< 1
	Silver, Total	1.4
LF-3 1-2 ft.	Arsenic, Total	50
	Barium, Total	970
	Cadmium, Total	0.2
	Chromium, Total	45
	Chromium 6+, Total	< 1
	Lead, Total	24
	Mercury, Total	0.9
	Selenium, Total	< 1
	Silver, Total	< 1.0

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012050

REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil (EP Toxicity Inorganics)

Sample Identification	Type of Analysis		mg/liter
OW-4 2-3 Ft.	Arsenic	<	0.01
	Barium	<	10
	Cadmium	<	0.001
	Chromium	<	0.001
	Chromium 6+	<	0.01
	Lead	<	0.001
	Mercury	<	0.0004
	Selenium	<	0.01
	Silver	<	0.01
	Total Organic Carbon		4700 ug/gm

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TOTAL METALS

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REPORT OF ANALYSIS

SAMPLES RECEIVED

CUSTOMER ORDER NUMBER

PE OF ANALYSIS Soil

Sample Identification	Type of Analysis	ug/g
LF-1 2-3 ft.	Arsenic, Total	50
	Barium, Total	860
	Cadmium, Total	0.2
	Chromium, Total	34
	Chromium 6+, Total	< 1
	Lead, Total	24
	Mercury, Total	0.05
	Selenium, Total	< 1
	Silver, Total	2.2
LF-2 2-3 ft.	Arsenic, Total	50
	Barium, Total	940
	Cadmium, Total	< 0.1
	Chromium, Total	36
	Chromium 6+, Total	< 1
	Lead, Total	23
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	< 1.0

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REPORT OF ANALYSIS

SAMPLES RECEIVED	CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil

CORRECTED COPY

Sample Identification	Type of Analysis	ug/g
OW-4 0-1 Ft.	Arsenic, Total	40
	Barium, Total	930
	Cadmium, Total	0.2
	Chromium, Total	30
	Chromium 6+, Total	< 1
	Lead, Total	29
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	< 1.0
LF-1 1-2 ft.	Arsenic, Total	50
	Barium, Total	970
	Cadmium, Total	0.2
	Chromium, Total	34
	Chromium 6+, Total	1
	Lead, Total	27
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	< 1.0

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REPORT OF ANALYSIS

SAMPLES RECEIVED Soil

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS CORRECTED COPY

Sample Identification	Type of Analysis	ug/g
LF-1 0-1 ft	Arsenic, Total	20
	Barium, Total	980
	Cadmium, Total	0.2
	Chromium, Total	34
	Chromium 6+, Total	< 1
	Lead, Total	26
	Mercury, Total	0.04
	Selenium, Total	< 1
	Silver, Total	7.8
LF-2 0-1 ft.	Arsenic, Total	40
	Barium, Total	970
	Cadmium, Total	0.2
	Chromium, Total	29
	Chromium 6+, Total	< 1
	Lead, Total	28
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	2.0

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SAMPLES RECEIVED	CUSTOMER ORDER NUMBER
TYPE OF ANALYSIS Soil	CORRECTED COPY

Sample Identification	Type of Analysis	ug/g
LF-3 0-1 ft.	Arsenic, Total	40
	Barium, Total	1,000
	Cadmium, Total	0.4
	Chromium, Total	34
	Chromium 6+, Total	1
	Lead, Total	26
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	< 1.0
LF-4 0-1 ft.	Arsenic, Total	50
	Barium, Total	880
	Cadmium, Total	0.2
	Chromium, Total	36
	Chromium 6+, Total	< 1
	Lead, Total	29
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	2.7

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CUSTOMER ORDER NUMBER

PE OF ANALYSIS Soil

CORRECTED COPY

Sample Identification	Type of Analysis	ug/g
LF-3 2-3 Ft.	Arsenic, Total	40
	Barium, Total	870
	Cadmium, Total	0.2
	Chromium, Total	40
	Chromium 6+, Total	< 1
	Lead, Total	26
	Mercury, Total	0.04
	Selenium, Total	< 1
	Silver, Total	< 1.0
LF-4 2-3 ft	Arsenic, Total	50
	Barium, Total	880
	Cadmium, Total	0.2
	Chromium, Total	23
	Chromium 6+, Total	2
	Lead, Total	28
	Mercury, Total	0.05
	Selenium, Total	< 1
	Silver, Total	< 1.0

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SAMPLES RECEIVED

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PE OF ANALYSIS Soil

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Sample Identification	Type of Analysis	ug/g
LF-4 1-2 ft.	Arsenic, Total	50
	Barium, Total	1,000
	Cadmium, Total	0.1
	Chromium, Total	33
	Chromium 6+, Total	< 1
	Lead, Total	23
	Mercury, Total	0.09
	Selenium, Total	< 1
	Silver, Total	< 1.0
OW-4 1-2 ft.	Arsenic, Total	50
	Barium, Total	970
	Cadmium, Total	< 0.1
	Chromium, Total	34
	Chromium 6+, Total	< 1
	Lead, Total	23
	Mercury, Total	0.05
	Selenium, Total	< 1
	Silver, Total	3.2

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SAMPLES RECEIVED

CUSTOMER ORDER NUMBER

PE OF ANALYSIS Soil

CORRECTED COPY

Sample Identification	Type of Analysis	ug/g
OW-4 2-3 ft.	Arsenic, Total	50
	Barium, Total	890
	Cadmium, Total	0.3
	Chromium, Total	29
	Chromium 6+, Total	< 1
	Lead, Total	25
	Mercury, Total	< 0.04
	Selenium, Total	< 1
	Silver, Total	< 1.0

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	ug/gm
OW-4 3-4 Ft.	Chromium (Total Content)	20

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SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	ug/gm
OW-4 4-5 Ft.	Chromium (Total Content)	20

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SAMPLES RECEIVED 11/8/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	ug/gm
OW-4 5-6 Ft.	Chromium (Total Content)	30

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/8/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil

Sample Identification	Type of Analysis	
CLF 1 & 2 0-1 FT.	Sieve Analysis (Texture)	*
	Nitrogen Content	420 ug/gm
	Phosphorus Content	180 ug/gm
	Cation Exchange Capacity	43.9 meq/100 gm
	Sodium Absorption Ratio	9.5
CLF-3.4 OW 4 0-1 FT.	Sieve Analysis (Texture)	*
	Nitrogen Content	540 ug/gm
	Phosphorus Content	180 ug/gm
	Cation Exchange Capacity	42.8 meq/100 gm
	Sodium Absorption Ratio	18.4

* To be reported at a later date.

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CITY City Center
Albuquerque, NM 87110
ATTENTION William Mead
INVOICE NO. 101082

REPORT OF ANALYSIS

SAMPLES RECEIVED 1/9/81

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil Bulk

Sample Identification	Type of Analysis	mm	Name	%
CLF- 1 & 2 #3				
0 to 1 foot	Sieve	0.5-0.25	Medium Sand	0.3
		0.25-0.1	Fine Sand	1.4
		0.1-0.043	Very Fine Sand	25.2
		0.043	Silt and Clay	73.1
CLF - 1 & 2 #2				
0 to 1 foot	Sieve	0.5-0.25	Medium Sand	0.2
		0.25-0.1	Fine Sand	1.0
		0.1-0.043	Very Fine Sand	15.8
		0.043	Silt & Clay	83.0
CLF-3,4, OW 4 #2				
0 to 1 foot	Sieve	0.5-0.25	Medium Sand	0.3
		0.25-0.1	Fine Sand	1.6
		0.1-0.043	Very Fine Sand	16.6
		0.043	Silt & Clay	81.5
CLF-3, 4, OW 4 #3				
0 to 1 foot				
by: Dames & Moore	Sieve	0.5-0.25	Medium Sand	2.4
		0.25-0.1	Fine Sand	5.7
		0.1-0.43	Very Fine Sand	16.9
		0.043	Silt & Clay	75.0

APPROVED BY
1/22/81 James J. Mueller, President

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/10/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Soil Analysis -

Sample Identification	Analysis	Cm/hr*	% Moisture
LF-1 6" to 12" Depth	Vertical Permeability	0.070 (0.0276 in/hr)	
	Moisture Content		10.2
LR-4 6" to 24" Depth	Vertical Permeability	0.080 (0.0312 in/hr)	
	Moisture Content		9.1
OW-4 18" to 24" Depth	Vertical Permeability	0.059 (0.0232 in/hr)	
	Moisture Content		10.6
LF-2 6" to 12" Depth	Vertical Permeability	0.059 (0.0232 in/hr)	
	Moisture Content		9.3
OW-4 18" to 24" Depth	Vertical Permeability	0.114 (0.0450 in/hr)	
	Moisture Content		10.1

*Cm/hr = cc/hr/Cm^2.

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APPENDIX B-2

GROUND WATER IN

OBSERVATION WELLS

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Albuquerque, NM 87110
ATTENTION William Mead
INVOICE NO. 012256

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/5/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-1 Shell Oil Ciniza Refinery Pres. w/Nitric Acid	Arsenic	< 0.01
	Calcium	7.6
	Chromium	0.007
	Iron	0.07
	Manganese	0.04
	Selenium	< 0.01
	Sodium	270
OW-4 Shell Oil Ciniza Refinery Pres. w/10 ml Conc. Nitric Acid	Arsenic	< 0.01
	Calcium	14
	Chromium	0.005
	Iron	0.1
	Manganese	0.07
	Selenium	< 0.01
	Sodium	230

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12/31/80 Elmer D. Martinez, Operations Division Manager

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012158

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/5/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-1 Shell Oil - Ciniza Pres. w/10 ml of 1 N Sodium Hydroxide	Cyanide	< 0.1
OW-4 Shell Oil - Ciniza Refinery pres. w/10 ml of 1 N Sodium Hydroxide	Cyanide	< 0.1

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012180

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/5/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/liter
OW-1 Shell Oil - Ciniza Refinery	Chlorides	28
	Fluorides	0.55
	pH units	7.8
	Solids, Total Dissolved	776
	Sulfates	167
OW-4 Shell Oil - Ciniza Refinery	Chlorides	57
	Fluorides	1.0
	pH units	8.1
	Solids, Total Dissolved	741
	Sulfates	188

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REPORT OF ANALYSIS

SAMPLES RECEIVED 12/5/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-1 - Shell Oil - Ciniza Refinery pres. w/10 ml. conc. sulfuric acid	Nitrogen, Nitrate (as N)	0.5
OW-4 - Shell Oil - Ciniza Refinery pres. w/10 ml. conc. sulfuric acid	Nitrogen, Nitrate (as N)	0.2

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/20/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis		mg/liter
Well # OW-3 Location: Ciniza Owner-Shell Pres. w/10ml of IN Soln. sodium Hydroxide	Cyanide	<	0.1
Well # OW-3 Location: Ciniza Owner-Shell (Pre. w/10ml. Conc. Sulfuric Acid)	Nitrogen, Nitrate (as N)	<	0.1
Ciniza Refinery - Well #OW-2 Preserved w/10ml. Sod. hydroxide, 1 Normal	Cyanide	<	0.1
Ciniza Refinery-Well # OW-2 preserved w/10ml. conc. Nitric Acid	Arsenic	<	0.01
	Calcium		~~2000~~ 20
	Chromium (Total)		0.003
	Iron		1.1
	Manganese		0.2
	Selenium		0.01
	Sodium		390
Ciniza Refinery - Well # OW-2 preserved w/10ml. conc. Sulfuric Acid	Nitrogen, Nitrates (as N)		0.1
Ciniza Refinery - Well # OW-2	Chlorides		39
	Fluoride		1.6
	pH		7.6
	Solids, Total Dissolved		856
	Sulfates		16

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/20/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water "CORRECTED REPORT"

Sample Identification	Type of Analysis	mg/liter
Ciniza Refinery - Well # OW-2 Preserved w/10 ml. conc. Nitric Acid	Calcium	20

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/20/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
Well #OW-3 Location: Ciniza Owner - Shell	Chlorides	36
	Fluoride	1.4
	pH Units	7.7
	Solids, Total Dissolved	876
	Sulfates	79

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REPORT OF ANALYSIS

SAMPLES RECEIVED 11/20/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/liter
Well # OW-3	Arsenic	< 0.01
Location: Ciniza	Calcium	3.4
Owner: Shell	Chromium (Total)	0.007
(Pres. w/10ml. conc.	Iron	1.8
nitric acid)	Manganese	0.003
	Selenium	< 0.01
	Sodium	370

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REPORT OF ANALYSIS

SAMPLES RECEIVED 12/9/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-9	Arsenic	< 0.01
	Calcium	19
	Chromium, Total	0.004
	Iron	0.02
	Manganese	0.02
	Selenium	< 0.01
	Sodium	350

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VOICE NO. Bill Mead
012266

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/9/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis		mg/liter
OW-7	Arsenic	<	0.01
	Calcium		34
	Chromium (Total)		0.003
	Iron		0.3
	Manganese		0.02
	Selenium	<	0.01
	Sodium		270

APPROVED BY James J. Mueller, President

12/31/80

Controls for Environmental Pollution, Inc.
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Telephone 505/982-9841

CUSTOMER Dames & Moore
ADDRESS 6400 Uptown Blvd. N.E. Suite 398W
CITY City Center
ATTENTION Albuquerque, NM 87110
INVOICE NO. William Mead
012158

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/9/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-7	Cyanide	< 0.1
OW-9	Cyanide	< 0.1

APPROVED BY

12/22/80 Elmer D. Martinez, Operations Division Manager

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INVOICE NO. Bill Mead
012225

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/9/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-7	Chloride	21
	Fluoride	0.37
	pH Units	8.7
	Solids, Total Dissolved	717
	Sulfate	166
OW-9	Chloride	56
	Fluoride	0.80
	pH Units	7.8
	Solids, Total Dissolved	1060
	Sulfate	391

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012207

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/9/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-7	Nitrogen, Nitrate (as N)	< 0.1
OW-9	Nitrogen, Nitrate (as N)	0.5

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012267

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/liter
OW-16-Shell Oil-Ciniza Refinery preserved w/10ml of Conc. sulfuric acid	Nitrogen, Nitrate (as N)	3.7
OW-10-Shell Oil- Ciniza Refinery preserved w/10ml Conc. nitric acid	Arsenic	< 0.01
	Calcium	17
	Chromium	0.002
	Iron	0.6
	Manganese	0.03
	Selenium	0.01
	Sodium	360
OW-16-Shell Oil - Ciniza Refinery preserved w/10ml Conc. nitric acid	Arsenic	0.03
	Calcium	24
	Chromium	0.003
	Iron	1.0
	Manganese	0.06
	Selenium	0.01
	Sodium	270

APPROVED BY James J. Mueller, President

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INVOICE NO. Bill Mead
101052

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water For Cyanide

Sample Identification	mg/liter
OW-10-Shell Oil Ciniza Refinery pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-16-Shell Oil Ciniza Refinery pres.w/10ml of 1 N Sodium Hydroxide	< 0.1

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1/16/81

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'OICE NO. Bill Mead
101216

REPORT OF ANALYSIS

SAMPLES RECEIVED 1-6-81

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-11 Shell Oil Ciniza Refinery	Chloride	88
	Fluoride	0.20
	PH Units	7.8
	Total Dissolved Solids	935
	Sulfate	196
OW-12 Shell Oil Ciniza Refinery	Chloride	120
	Fluoride	0.52
	PH Units	7.5
	Total Dissolved Solids	746
	Sulfate	100
OW-13 Shell Oil Ciniza Refinery	Chloride	19
	Fluoride	1.0
	PH Units	8.5
	Total Dissolved Solids	659
	Sulfate	207
OW-17 Shell Oil Ciniza Refinery	Chloride	86
	Fluoride	0.47
	PH Units	7.4
	Total Dissolved Solids	818
	Sulfate	319
OW-20 Shell Oil Ciniza Refinery	Chloride	100
	Fluoride	0.40
	PH Units	11.6
	Total Dissolved Solids	841
	Sulfate	214

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REPORT OF ANALYSIS

SAMPLES RECEIVED 1-6-81

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-14 Shell Oil Ciniza Refinery	Chloride	210
	Fluoride	0.62
	PH Units	7.3
	Total Dissolved Solids	839
	Sulfate	104
OW-14 Shell Oil Ciniza Refinery	Fluoride	0.58
	PH Units	7.3
	Sulfate	102
OW-24 Shell Oil Ciniza Refinery	Chloride	33
	Fluoride	0.70
	PH Units	7.8
	Total Dissolved Solids	784
	Sulfate	72

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ATTENTION William Mead
INVOICE NO. 101236

REPORT OF ANALYSIS

SAMPLES RECEIVED 1/6/81

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-12-Shell Oil Ciniza Refinery	Hydrocarbons	7.1
OW-14 - Shell Oil Ciniza Refinery	Hydrocarbons	6.4
OW-16 - Shell Oil Ciniza Refinery	Hydrocarbons	4.0
OW-17 - Shell Oil Ciniza Refinery	Hydrocarbons	25
OW 20 - Shell Oil - Ciniza Refinery	Hydrocarbons	5.5

2/4/81

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INVOICE NO. Bill Mead
012205

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-10 - Shell Oil - Ciniza Refinery preserved w/10 ml. of conc. sulfuric acid	Nitrogen, Nitrate (as N)	0.3

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CITY Albuquerque, NM 87100
ATTENTION Bill Mead
VOICE NO. 101091

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water Analysis -

Sample Identification	Analysis	mg/l
OW-10 Shell Oil Ciniza Refinery	Chlorides	79
	Fluorides	0.64
	pH Units	7.6
	Total Dissolved Solids	1030
	Sulfates	331

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INVOICE NO. 101091

REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water Analysis -

Sample Identification	Analysis	mg/l
OW-10 Shell Oil Ciniza Refinery	Chlorides	76
	Fluorides	0.64
	pH Units	7.7
	Total Dissolved Solids	1040
	Sulfates	247

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REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water Analysis -

Sample Identification	Analysis	mg/l
OW-16 Shell Oil Ciniza Refinery	Chlorides	110
	Fluorides	0.86
	pH Units	7.7
	Total Dissolved Solids	759
	Sulfates	81

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REPORT OF ANALYSIS

SAMPLES RECEIVED 12/17/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water Analysis -

Sample Identification	Analysis	mg/l
OW-16 Shell Oil Ciniza Refinery	Chlorides	230
	Fluorides	0.9
	pH Units	7.6
	Total Dissolved Solids	799
	Sulfates	15

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INVOICE NO. Bill Mead
101110

REPORT OF ANALYSIS

SAMPLES RECEIVED 1/6/81 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/liter
OW-11-Shell Oil-Ciniza Refinery Sample preserved w/10ml of Nitric Acid	Arsenic	< 0.01
	Calcium	11
	Chromium	0.003
	Iron	0.3
	Lead	0.002
	Manganese	0.03
	Selenium	< 0.01
	Sodium	380
OW-12-Shell Oil-Ciniza Refinery preserved w/10ml of conc. Nitric Acid	Arsenic	< 0.01
	Calcium	11
	Chromium	0.004
	Iron	0.7
	Lead	0.03
	Manganese	0.08
	Selenium	< 0.01
	Sodium	310
OW-13-Shell Oil-Ciniza Refinery preserved w/10ml of conc. Nitric Acid	Arsenic	< 0.01
	Calcium	6.5
	Chromium	0.009
	Iron	0.6
	Lead	0.03
	Manganese	0.06
	Selenium	< 0.01
	Sodium	270
OW-14-Shell Oil-Ciniza Refinery pres. w/10ml of conc. Nitric Acid	Arsenic	< 0.01
	Calcium	34
	Chromium	0.008
	Iron	0.2
	Lead	0.02
	Manganese	0.06
	Selenium	< 0.01
	Sodium	290

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INVOICE NO. Bill Mead
101110

REPORT OF ANALYSIS

SAMPLES RECEIVED 1/6/81 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/liter
OW-17-Shell Oil- Ciniza Refinery pres. w/10ml of conc. Nitric Acid	Arsenic	0.02
	Calcium	400
	Chromium	0.02
	Iron	4.5
	Lead	0.5
	Manganese	4.2
	Selenium	< 0.01
	Sodium	250
OW-20-Shell Oil-Ciniza Refinery pres. w/10ml of conc. Nitric Acid	Arsenic	< 0.01
	Calcium	6.6
	Chromium	0.1
	Iron	0.3
	Lead	0.04
	Manganese	0.02
	Selenium	< 0.01
	Sodium	320
OW-24-Shell Oil-Ciniza Refinery pres. w/10ml Conc. Nitric Acid	Arsenic	< 0.01
	Calcium	23
	Chromium	0.001
	Iron	0.2
	Lead	0.03
	Manganese	0.3
	Selenium	< 0.01
	Sodium	310

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CITY City Center
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VOICE NO. Bill Mead
101053

REPORT OF ANALYSIS

SAMPLES RECEIVED 1/6/81 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water for Cyanide

Sample Identification	mg/liter
OW-11-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-12-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-13-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-14-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-17-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-20-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1
OW-24-Shell Oil Ciniza Refinery Pres.w/10ml of 1 N Sodium Hydroxide	< 0.1

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1/16/81

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CITY City Center
ATTENTION Albuquerque, NM 87110
VOICE NO. William Mead
101190

REPORT OF ANALYSIS

SAMPLES RECEIVED 1/6/81

CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Water

Sample Identification	Type of Analysis	mg/l
OW-11-Shell Oil Ciniza Refinery - Pres. w/10 ml of conc. Sulfuric Acid	Nitrogen, Nitrate (as N)	1.8
OW-12-Shell Oil - Ciniza Refinery - Pres. w/10 ml of conc. Sulfuric Acid	Nitrogen, Nitrate (as N)	0.1
OW-13-Shell Oil - Ciniza Refinery - Pres. w/10 ml of conc. Sulfuric Acid	Nitrogen, Nitrate (as N)	< 0.1
OW-14-Shell Oil - Ciniza Refinery - Pres. w/10 ml of conc. Sulfuric Acid	Nitrogen, Nitrate (as N)	0.2
OW-17-Shell Oil - Ciniza Refinery - Pres. w/10 ml of Sulfuric Acid	Nitrogen, Nitrate (as N)	0.8
OW-20-Shell Oil - Ciniza Refinery - Pres. w/10 ml of conc. Sulfuric Acid	Nitrogen, Nitrate (as N)	1.3
OW-24-Shel Oil - Ciniza Refinery - Pres. w/10 ml of conc. Sulfuric Acid	Nitrogen, Nitrate (as N)	0.5

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1/29/81 Elmer D. Martinez, Operations Divisic Manager

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APPENDIX B-3

PLANT WASTES

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ADDRESS Suite 398W, City Center
CITY 6400 Uptown Blvd., N.E.
ATTENTION Albuquerque, NM 87110
INVOICE NO. Bill Mead
012179

REPORT OF ANALYSIS

SAMPLES RECEIVED 11/10/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Sludge (Date Collected 11/6/80)

Sample Identification	Type of Analysis	mg/liter
API Seperator Emulsion	Arsenic	< 0.01
	Barium	< 10
	Cadmium	< 0.001
	Chromium	0.006
	Chromium 6+	< 0.01
	Lead (Total)	6.1
	Mercury	< 0.004
	Selenium	< 0.01
	Silver	< 0.01
	Total Chrome	200 ug/gm
		percent by weight
	Total Organic Carbon	17.8

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12/24/80 PAGE 1 OF 1 PAGE

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ATTENTION Albuquerque, NM 87110
INVOICE NO. Bill Mead
012050

REPORT OF ANALYSIS

SAMPLES RECEIVED 11/10/80 | CUSTOMER ORDER NUMBER

TYPE OF ANALYSIS Sludge

Sample Identification	Type of Analysis	
Leaded Tank Sludge;	Lead (Total)	690 ug/g
Tank 59	EP Lead	0.08 mg/liter
Date Collected 11/4/80	Total Organic Lead	2.4 ug/gm

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Elmer D. Martinez, Operations Division, Mgr.
12/11/80 PAGE 19 OF 19 PAGE

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APPENDIX B-4

LABORATORY DETECTION LIMITS

Lower Limits of Detection for Water

Water Analysis	mg/liter
Arsenic	0.01
Barium	0.1
Cadmium	0.001
Calcium	0.1
Chromium	0.001
Chromium 6+	0.01
Cyanide	0.1
Fluoride	0.01
Iron	0.01
Lead	0.001
Manganese	0.001
Mercury	0.0004
Nitrogen, Nitrate (as N)	0.1
Oil & Grease	1.0
Selenium	0.01
Silver	0.01
Sodium	0.01
Solids, Total Dissolved	5.0
Sulfate	5.0

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Lower Limits of Detection
for EP Toxicity Analysis

Analysis	mg/liter
Arsenic	0.01
Barium	10
Cadmium	0.001
Chromium	0.001
Chromium +6	0.01
Lead	0.001
Mercury	0.0004
Selenium	0.01
Silver	0.01

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Lower Limits of Detection
for Soils

Analysis	ug/gm
Arsenic	1
Barium	10
Cadmium	0.1
Chromium	0.1
Chromium +6	1
Lead	0.1
Mercury	0.04
Selenium	1
Silver	1
Total Organic Carbon	10

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APPENDIX B-5

LABORATORY CERTIFICATION

AND

SUMMARY OF QUALITY CONTROL PRACTICES

The ENVIRONMENTAL IMPROVEMENT DIVISION of The New Mexico Health and Environment Department

Certifies

CONTROLS FOR ENVIRONMENTAL POLLUTION

To perform analyses of water samples as required by the New Mexico Regulations Governing Water Supplies for the following parameters:

MICROBIOLOGICAL: TOTAL COLIFORM

INORGANIC AND ORGANIC: ALL PARAMETERS

May 1, 1980
Date of Certification

May 1, 1981
Date of Expiration

EID Director

Certification Officer

SUMMARY OF QUALITY CONTROL PRACTICES

PREPARED BY:

CONTROLS FOR ENVIRONMENTAL POLLUTION, INC.

P.O. BOX 5351

SANTA FE, NEW MEXICO 87502

RECEIVED FEB 21 1981

Introduction

Quality Control measures are taken from the time the samples arrive to the time data is reported. The following is a brief summary of steps taken during the analysis of your samples.

Basic Function

The Quality Control/Quality Assurance department is responsible for the conduct of the Analytical Laboratory Quality Control program and for taking or recommending measures to ensure the fulfillment of the quality objectives of management and the carrying out of Quality Control policies in the most efficient and economical manner commesurate with ensuring continuing accuracy and precision of data produced.

Responsibilities and Authority

1. Developes and carries out quality control programs, including statistical procedures and techniques, which will help laboratories to meet authorized quality standards at minimum cost; and advises and assists management in the installation, staffing and supervision of such programs.
2. Monitors quality control activities of the laboratory to determine conformance with authorized policy and procedures and with sound practice; and make appropriate recommendations for correction and improvement as may be necessary.
3. Seeks out and evaluates new ideas and current development in the field of quality control and recommends means for their application wherever advisable.
4. Advises management in reviewing technology, methods and equipment, with respect to quality aspects.
5. Advises the Purchasing section regarding quality of purchased materials, reagents and chemicals.
6. Recommends packaging materials and procedures.
7. Performs related duties as assigned.

Quality Control Practices

Upon arrival at the laboratory, each sample is assigned a color-coded number. This code number is placed on all apparatus used for that sample during chemical and radiometric determinations. This code number is recorded in the laboratory receiving report which is filled out at the time that the samples are received. The laboratory receiving report consists of five pages which are distributed to various departments within the company.

Blank and standard spike samples are analyzed routinely as part of Controls for Environmental Pollution's internal quality control program. These samples are indistinguishable from regular samples to prevent samples from receiving preferential treatment. In addition, each chemist prepares known reference samples which he can use to measure his quality of work.

All reagents, carriers and radioactive tracers and instrumentation used in the analysis are calibrated on a scheduled basis as described by the quality assurance plan.

In summary, the methods employed for analyses are those which measure the desired constituent with precision and accuracy and meet the data needs in the presence of the interferences normally encountered. The routine analysis of spiked samples is the measurement of quality while the use of analytical grade reagents is a controls of measure. The quality control program has two primary functions. First, the program monitors the reliability of the results reported. The second function is the control of quality in order to meet the program requirements.

APPENDIX C

EXCERPTS FROM RCRA

REGULATIONS, PART 265,

SUBPART M - LAND TREATMENT

§§ 261.21 or 261.23 of this Chapter, and (ii) complies with § 265.17(b); or

(2) The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react.

§ 265.257 Special requirements for incompatible wastes.

(a) Incompatible wastes, or incompatible wastes and materials, (see Appendix V for examples) must not be placed in the same pile, unless § 265.17(b) is complied with.

(b) A pile of hazardous waste that is incompatible with any waste or other material stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials, or protected from them by means of a dike, berm, wall, or other device.

[*Comment:* The purpose of this is to prevent fires, explosions, gaseous emissions, leaching, or other discharge of hazardous waste or hazardous waste constituents which could result from the contact or mixing of incompatible wastes or materials.]

(c) Hazardous waste must not be piled on the same area where incompatible wastes or materials were previously piled, unless that area has been decontaminated sufficiently to ensure compliance with § 265.17(b).

§§ 265.258–265.269 [Reserved]

Subpart M—Land Treatment

§ 265.270 Applicability.

The regulations in this Subpart apply to owners and operators of hazardous waste land treatment facilities, except as § 265.1 provides otherwise.

§ 265.271 [Reserved]

§ 265.272 General operating requirements.

(a) Hazardous waste must not be placed in or on a land treatment facility unless the waste can be made less hazardous or non-hazardous by biological degradation or chemical reactions occurring in or on the soil.

(b) Run-on must be diverted away from the active portions of a land treatment facility.

(c) Run-off from active portions of a land treatment facility must be collected.

[*Comment:* If the collected run-off is a hazardous waste under Part 261 of this Chapter, it must be managed as a hazardous waste in accordance with all applicable requirements of Parts 262, 263, and 265 of this Chapter. If the collected run-off is discharged through a point source to waters of the United States, it is subject to the requirements of Section 402 of the Clean Water Act, as amended.]

(d) The date for compliance with paragraphs (b) and (c) of this Section is 12 months after the effective date of this Part.

§ 265.273 Waste analysis.

In addition to the waste analyses required by § 265.13, before placing a hazardous waste in or on a land treatment facility, the owner or operator must:

(a) Determine the concentrations in the waste of any substances which exceed the maximum concentrations contained in Table I of § 261.24 of this Chapter that cause a waste to exhibit the EP toxicity characteristic.

(b) For any waste listed in Part 261, Subpart D, of this Chapter, determine the concentrations of any substances which caused the waste to be listed as a hazardous waste; and

(c) If food chain crops are grown, determine the concentrations in the waste of each of the following constituents: arsenic, cadmium, lead, and mercury, *unless* the owner or operator has written, documented data that show that the constituent is not present.

[*Comment:* Part 261 of this Chapter specifies the substances for which a waste is listed as a hazardous waste. As required by § 265.13, the waste analysis plan must include analyses needed to comply with §§ 265.281 and 265.282. As required by § 265.73, the owner or operator must place the results from each waste analysis, or the documented information, in the operating record of the facility.]

§§ 265.274–265.275 [Reserved]

§ 265.276 Food chain crops.

(a) An owner or operator of a hazardous waste land treatment facility on which food chain crops are being grown, or have been grown and will be grown in the future, must notify the Regional Administrator within 60 days after the effective date of this Part.

[*Comment:* The growth of food chain crops at a facility which has never before been used for this purpose is a significant change in process under § 122.23(c)(3) of this Chapter. Owners or operators of such land treatment facilities who propose to grow food chain crops after the effective date of this Part must comply with § 122.23(c)(3) of this Chapter.]

(b)(1) Food chain crops must not be grown on the treated area of a hazardous waste land treatment facility unless the owner or operator can demonstrate, based on field testing, that any arsenic, lead, mercury, or other constituents identified under § 265.273(b):

(i) Will not be transferred to the food portion of the crop by plant uptake or direct contact, and will not otherwise be ingested by food chain animals (e.g., by grazing); or

(ii) Will not occur in greater concentrations in the crops grown on the land treatment facility than in the same crops grown on untreated soils under similar conditions in the same region.

(2) The information necessary to make the demonstration required by paragraph (b)(1) of this Section must be kept at the facility and must, at a minimum:

(i) Be based on tests for the specific waste and application rates being used at the facility; and,

(ii) Include descriptions of crop and soil characteristics, sample selection criteria, sample size determination, analytical methods, and statistical procedures.

(c) Food chain crops must not be grown on a land treatment facility receiving waste that contains cadmium unless all requirements of paragraph (c)(1)(i) through (iii) of this Section or all requirements of paragraph (c)(2)(i) through (iv) of this Section are met.

(1) (i) The pH of the waste and soil mixture is 6.5 or greater at the time of each waste application, except for waste containing cadmium at concentrations of 2 mg/kg (dry weight) or less;

(ii) The annual application of cadmium from waste does not exceed 0.5 kilograms per hectare (kg/ha) on land used for production of tobacco, leafy vegetables, or root crops grown for human consumption. For other food chain crops, the annual cadmium application rate does not exceed:

Time period	Annual Cd application rate (kg/ha)
Present to June 30, 1984	2.0
July 1, 1984 to Dec. 31, 1986	1.25
Beginning Jan. 1, 1987	0.5

(iii) The cumulative application of cadmium from waste does not exceed the levels in either paragraph (c)(1)(iii)(A) of this Section or paragraph (c)(1)(iii)(B) of this Section.

(A)

Soil cation exchange capacity (meq/100g)	Maximum cumulative application (kg/ha)	
	Background soil pH less than 6.5	Background soil pH greater than 6.5
Less than 5	5	5
5–15	5	10
Greater than 15	5	20

(B) For soils with a background pH of less than 6.5, the cumulative cadmium application rate does not exceed the levels below: *Provided*, that the pH of the waste and soil mixture is adjusted to and maintained at 6.5 or greater whenever food chain crops are grown.

Soil cation exchange capacity (meq/100g)	Maximum cumulative application (kg/ha)
Less than 5	5
5–15	10
Greater than 15	20

(2)(i) The only food chain crop produced is animal feed.

(ii) The pH of the waste and soil mixture is 6.5 or greater at the time of waste application or at the time the crop is planted, whichever occurs later, and this pH level is maintained whenever food chain crops are grown.

(iii) There is a facility operating plan which demonstrates how the animal feed will be distributed to preclude ingestion by humans. The facility operating plan describes the measures to be taken to safeguard against possible health hazards from cadmium entering the food chain, which may result from alternative land uses.

(iv) Future property owners are notified by a stipulation in the land record or property deed which states that the property has received waste at high cadmium application rates and that food chain crops should not be grown, due to a possible health hazard.

[*Comment:* As required by § 265.73, if an owner or operator grows food chain crops on his land treatment facility, he must place the information developed in this Section in the operating record of the facility.]

§ 265.277 [Reserved]

§ 265.278 Unsaturated zone (zone of aeration) monitoring.

(a) The owner or operator must have in writing, and must implement, an unsaturated zone monitoring plan which is designed to:

(1) Detect the vertical migration of hazardous waste and hazardous waste constituents under the active portion of the land treatment facility, and

(2) Provide information on the background concentrations of the hazardous waste and hazardous waste constituents in similar but untreated soils nearby; this background monitoring must be conducted before or in conjunction with the monitoring required under paragraph (a)(1) of this Section.

(b) The unsaturated zone monitoring plan must include, at a minimum:

(1) Soil monitoring using soil cores, and

(2) Soil-pore water monitoring using devices such as lysimeters.

(c) To comply with paragraph (a)(1) of this Section, the owner or operator must demonstrate in his unsaturated zone monitoring plan that:

(1) The depth at which soil and soil-pore water samples are to be taken is below the depth to which the waste is incorporated into the soil;

(2) The number of soil and soil-pore water samples to be taken is based on the variability of:

(i) The hazardous waste constituents (as identified in § 265.273(a) and (b)) in the waste and in the soil; and

(ii) The soil type(s); and

(3) The frequency and timing of soil and soil-pore water sampling is based on the frequency, time, and rate of waste application, proximity to ground water, and soil permeability.

(d) The owner or operator must keep at the facility his unsaturated zone monitoring plan, and the rationale used in developing this plan.

(e) The owner or operator must analyze the soil and soil-pore water samples for the hazardous waste constituents that were found in the waste during the waste analysis under § 265.273 (a) and (b).

[*Comment:* As required by § 265.73, all data and information developed by the owner or operator under this Section must be placed in the operating record of the facility.]

§ 265.279 Recordkeeping.

The owner or operator of a land treatment facility must keep records of the application dates, application rates, quantities, and location of each hazardous waste placed in the facility, in the operating record required in § 265.73.

§ 265.280 Closure and post-closure.

(a) In the closure plan under § 265.112 and the post-closure plan under § 265.118, the owner or operator must address the following objectives and indicate how they will be achieved:

(1) Control of the migration of hazardous waste and hazardous waste constituents from the treated area into the ground water;

(2) Control of the release of contaminated run-off from the facility into surface water;

(3) Control of the release of airborne particulate contaminants caused by wind erosion; and

(4) Compliance with § 265.276 concerning the growth of food-chain crops.

(b) The owner or operator must consider at least the following factors in addressing the closure and post-closure care objectives of paragraph (a) of this Section:

(1) Type and amount of hazardous waste and hazardous waste constituents applied to the land treatment facility;

(2) The mobility and the expected rate of migration of the hazardous waste and hazardous waste constituents;

(3) Site location, topography, and surrounding land use, with respect to the potential effects of pollutant migration (e.g., proximity to ground water, surface water and drinking water sources);

(4) Climate, including amount, frequency, and pH of precipitation;

(5) Geological and soil profiles and surface and subsurface hydrology of the site, and soil characteristics, including cation exchange capacity, total organic carbon, and pH;

(6) Unsaturated zone monitoring information obtained under § 265.278; and

(7) Type, concentration, and depth of migration of hazardous waste constituents in the soil as compared to their background concentrations.

(c) The owner or operator must consider at least the following methods in addressing the closure and post-closure care objectives of paragraph (a) of this Section:

(1) Removal of contaminated soils;

(2) Placement of a final cover, considering: (i) Functions of the cover (e.g., infiltration control, erosion and run-off control, and wind erosion control), and (ii) Characteristics of the cover, including material, final surface contours, thickness, porosity and permeability, slope, length of run of slope, and type of vegetation on the cover;

(3) Collection and treatment of run-off;

(4) Diversion structures to prevent surface water run-on from entering the treated area; and

(5) Monitoring of soil, soil-pore water, and ground water.

(d) In addition to the requirements of § 265.117, during the post-closure care period, the owner or operator of a land treatment facility must:

(1) Maintain any unsaturated zone monitoring system, and collect and analyze samples from this system in a

manner and frequency specified in the post-closure plan:

(2) Restrict access to the facility as appropriate for its post-closure use: and

(3) Assure that growth of food chain crops complies with § 265.276.

§ 265.281 Special requirements for ignitable or reactive waste.

Ignitable or reactive wastes must not be land treated, unless the waste is immediately incorporated into the soil so that (1) the resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under §§ 261.21 or 261.23 of this Chapter, and (2) § 265.17(b) is complied with.

§ 265.282 Special requirements for incompatible wastes.

Incompatible wastes, or incompatible wastes and materials (see Appendix V for examples), must not be placed in the same land treatment area, unless § 265.17(b) is complied with.

§§ 265.283–265.299 [Reserved]

Subpart N—Landfills

§ 265.300 Applicability.

The regulations in this Subpart apply to owners and operators of facilities that dispose of hazardous waste in landfills, except as § 265.1 provides otherwise. A waste pile used as a disposal facility is a landfill and is governed by this Subpart.

§ 265.301 [Reserved]

§ 265.302 General operating requirements.

(a) Run-on must be diverted away from the active portions of a landfill.

(b) Run-off from active portions of a landfill must be collected.

[*Comment*: If the collected run-off is a hazardous waste under Part 261 of this Chapter, it must be managed as a hazardous waste in accordance with all applicable requirements of Parts 262, 263, and 265 of this Chapter. If the collected run-off is discharged through a point source to waters of the United States, it is subject to the requirements of Section 402 of the Clean Water Act, as amended.]

(c) The date for compliance with paragraphs (a) and (b) of this Section is 12 months after the effective date of this Part.

(d) The owner or operator of a landfill containing hazardous waste which is subject to dispersal by wind must cover or otherwise manage the landfill so that wind dispersal of the hazardous waste is controlled.

[*Comment*: As required by § 265.13, the waste analysis plan must include analyses needed to comply with §§ 265.312 and 265.313. As required by § 265.73, the owner or operator must place the results of these analyses in the operating record of the facility.]

§§ 265.303–265.308 [Reserved]

§ 265.309 Surveying and recordkeeping.

The owner or operator of a landfill must maintain the following items in the operating record required in § 265.73:

(a) On a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks; and

(b) The contents of each cell and the approximate location of each hazardous waste type within each cell.

§ 265.310 Closure and post-closure.

(a) The owner or operator must place a final cover over the landfill, and the closure plan under § 265.112 must specify the function and design of the cover. In the post-closure plan under § 265.118, the owner or operator must include the post-closure care requirements of paragraph (d) of this Section.

(b) In the closure and post-closure plans, the owner or operator must address the following objectives and indicate how they will be achieved:

(1) Control of pollutant migration from the facility via ground water, surface water, and air;

(2) Control of surface water infiltration, including prevention of pooling; and

(3) Prevention of erosion.

(c) The owner or operator must consider at least the following factors in addressing the closure and post-closure care objectives of paragraph (b) of this Section:

(1) Type and amount of hazardous waste and hazardous waste constituents in the landfill;

(2) The mobility and the expected rate of migration of the hazardous waste and hazardous waste constituents;

(3) Site location, topography, and surrounding land use, with respect to the potential effects of pollutant migration (e.g., proximity to ground water, surface water, and drinking water sources);

(4) Climate, including amount, frequency, and pH of precipitation;

(5) Characteristics of the cover including material, final surface contours, thickness, porosity and permeability, slope, length of run of slope, and type of vegetation on the cover; and

(6) Geological and soil profiles and surface and subsurface hydrology of the site.

(b) In addition to the requirements of § 265.117, during the post-closure care period, the owner or operator of a hazardous waste landfill must:

(1) Maintain the function and integrity of the final cover as specified in the approved closure plan;

(2) Maintain and monitor the leachate collection, removal, and treatment system (if there is one present in the landfill) to prevent excess accumulation of leachate in the system;

[*Comment*: If the collected leachate is a hazardous waste under Part 261 of this Chapter, it must be managed as a hazardous waste in accordance with all applicable requirements of Parts 262, 263, and 265 of this Chapter. If the collected leachate is discharged through a point source to waters of the United States, it is subject to the requirements of Section 402 of the Clean Water Act, as amended.]

(3) Maintain and monitor the gas collection and control system (if there is one present in the landfill) to control the vertical and horizontal escape of gases;

(4) Protect and maintain surveyed benchmarks; and

(5) Restrict access to the landfill as appropriate for its post-closure use.

§ 265.311 [Reserved]

§ 265.312 Special requirements for ignitable or reactive waste.

Ignitable or reactive waste must not be placed in a landfill, unless the waste is treated, rendered, or mixed before or immediately after placement in the landfill so that (1) the resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under §§ 261.21 or 261.23 of this Chapter, and (2) § 265.17(b) is complied with.

§ 265.313 Special requirements for incompatible wastes.

Incompatible wastes, or incompatible wastes and materials, (see Appendix V for examples) must not be placed in the same landfill cell, unless § 265.17(b) is complied with.

§ 265.314 Special requirements for liquid waste.

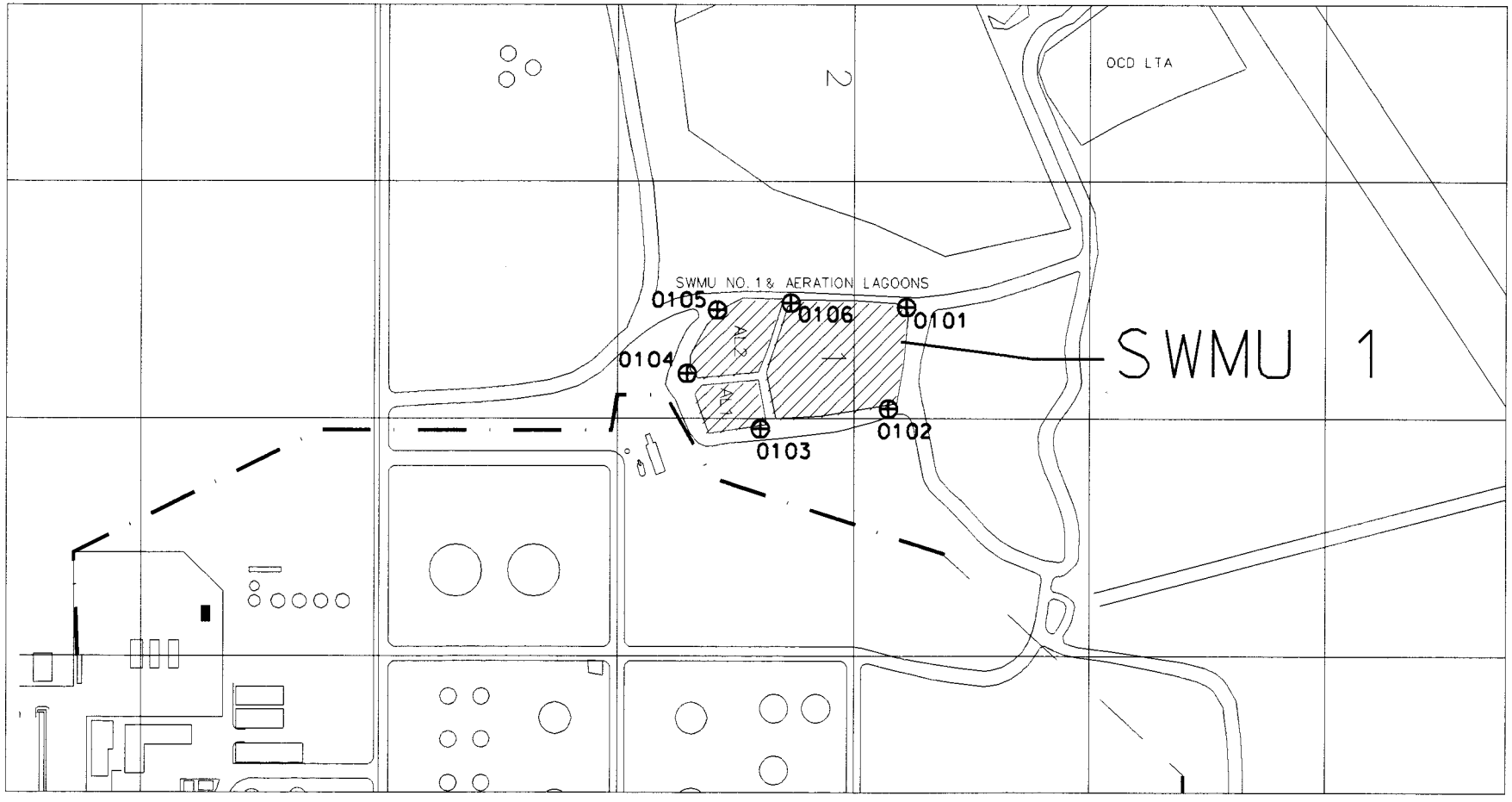
(a) Bulk or non-containerized liquid waste or waste containing free liquids must not be placed in a landfill, unless:

(1) The landfill has a liner which is chemically and physically resistant to the added liquid, and a functioning leachate collection and removal system with a capacity sufficient to remove all leachate produced; or

(2) Before disposal, the liquid waste or waste containing free liquids is treated or stabilized, chemically or physically (e.g., by mixing with an absorbent solid),

GIANT REFINING
CINIZA REFINERY

SWMU 1
Aeration Basin



PRECISION ENGINEERING, INC.

File #: 96-077

Bore Point:Aeration Basin

LOG OF TEST BORINGS

Site: Giant Refining
Ciniza Refinery

Water Elev:NOT ENCOUNTERED

Elevation: existing
Angle: N20W-SE
Date: 1996

Boring No.:0101

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	L	PI	CLASS.
	0.0-12.0		//////		SS	**CLAY**, WET, FIRM				
			//////		SS					
			//////		SS					
			//////							
			//////	2.5						
			//////							
			//////							
			//////							
			//////							
			//////	5.0						
			//////							
			//////							
			//////							
			//////							
			//////	7.5						
			//////							
			//////							
			//////							
			//////							
			//////	10						
			//////							
			//////							
			//////							
			//////							
	12.0		000000		SS	**GRAVEL**				
				15						
				20						
	22.0		------		SS	**CHINLE FORMATION-SHALE**				
	TD									

Size & Type of Boring:DISPLACEMENT PROBE

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 96-077

Bore Point:Aeration Basin

LOG OF TEST BORINGS

Site: Giant Refining
Ciniza Refinery

Water Elev:11.0'

Elevation: existing
Angle: N90E-W
Date: 1996

Boring No.:0102

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	L	PI	CLASS.
	0.0-8.0		//////		SS	**CLAY**, WET, FIRM				
			//////		SS					
			//////		SS					
			//////							
			//////	2.5						
			//////							
			//////							
			//////							
			//////							
			//////	5.0						
			//////							
			//////							
			//////							
			//////							
			//////	7.5						
	8.0-13.0		**00**		SS	**SAND**, FINE GRAVEL				
			00		SS					
			00		SS					
			00							
			00	10						
			00							
			00			FREE WATER AT 11.0'				
			00							
			00							
			00							
			00							
	13.0-16.0		//////		SS	**CLAY**				
			//////		SS					
			//////		SS					
			//////							
			//////	15						
			//////							
			//////							
			//////							
	17.0-18.5		**00**			**SAND**, FINE GRAVEL				
			00							
			00							
	18.5		------			**SHALE, CHINLE FORMATION**				
	TD									
				20						

Size & Type of Boring:Displacement Probe

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 96-077

Bore Point:Aeration Basin

LOG OF TEST BORINGS

Site: Giant Refining Ciniza Refinery

Water Elev:NOT ENCOUNTERED

Elevation: existing

Angle: N47E-SW

Boring No.:0103

Date: 1996

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	L	PI	CLASS.
	0.0-15.0		//////		SS	**CLAY**, WET, FIRM				
			//////		SS					
			//////		SS					
			//////							
			//////	2.5						
			//////							
			//////							
			//////							
			//////							
			//////	5.0						
			//////							
			//////							
			//////							
			//////							
			//////	7.5						
			//////							
			//////							
			//////							
			//////							
			//////	10						
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			//////							
			//////							
	15.0		------	15	SS	**CHINLE FORMATION-SHALE**				
	TD									
				20						

Size & Type of Boring:DISPLACEMENT PROBE

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 96-077

Bore Point: Aeration Basin

LOG OF TEST BORINGS

Site: Giant Refining Ciniza Refinery

Water Elev: NOT ENCOUNTERED

Elevation: existing

Angle: N52W-NW

Boring No.: 0104

Date: 1996

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
	0.0-16.0		//////		SS	**CLAY**, WET, FIRM				
			//////		SS					
			//////		SS					
			//////							
			//////	2.5						
			//////							
			//////							
			//////							
			//////							
			//////	5.0						
			//////							
			//////							
			//////							
			//////							
			//////	7.5						
			//////							
			//////							
			//////							
			//////							
			//////	10						
			//////							
			//////							
			//////							
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			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////	15						
			//////							
	16.0		------		SS	**CHINLE FORMATION-SHALE**				
	TD									
				20						

Size & Type of Boring: DISPLACEMENT PROBE

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 96-077

Bore Point:Aeration Basin

LOG OF TEST BORINGS

Site: Giant Refining Ciniza Refinery

Water Elev:11.0'

Elevation: existing

Angle: N24E-NE

Boring No.:0105

Date: 1996

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	L	PI	CLASS.
	0.0-20.0				SS SS SS	**CLAY**, WET, FIRM				
				2.5						
				5.0						
				7.5						
				10						
	11.0-12.0					**WATER BEARING**				
				15						
	20.0		------	20	SS	CHINLE FORMATION-SHALE				
	TD					VERY MINOR SAND ABOVE, NOT WATER BEARING				

Size & Type of Boring:DISPLACEMENT PROBE

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 96-077

Bore Point:Aeration Basin

LOG OF TEST BORINGS

Site: Giant Refining Ciniza Refinery

Water Elev:NOT ENCOUNTERED

Elevation: existing

Angle: N40E-NE

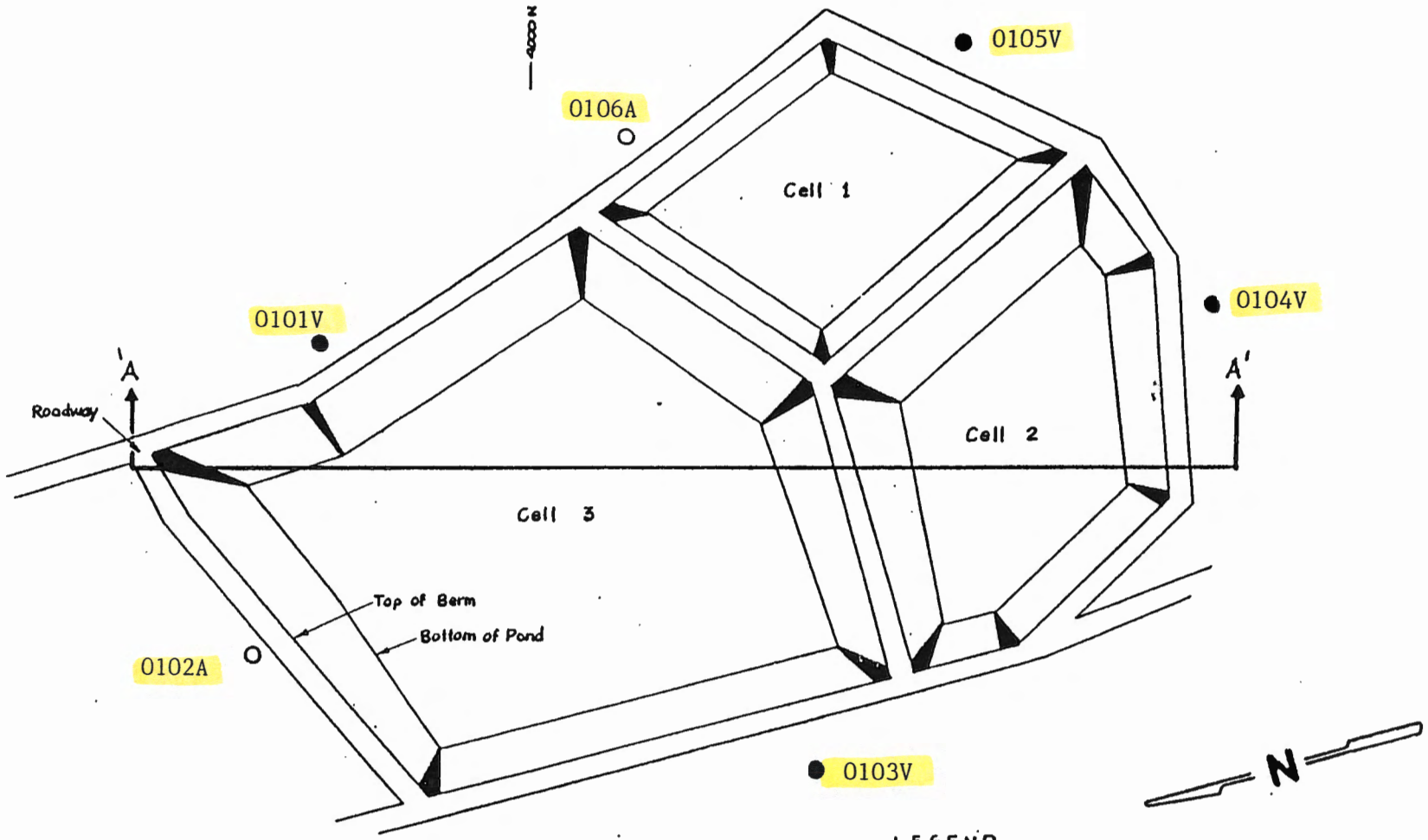
Boring No.:0106

Date: 1996

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	L	PI	CLASS.
	0.0-17.5		//////		SS	**CLAY**, WET, FIRM, SOME THIN SAND STRINGERS				
			//////		SS					
			//////		SS					
			//////							
			//////	2.5						
			//////							
			//////							
			//////							
			//////							
			//////	5.0						
			//////							
			//////							
			//////							
			//////							
			//////	7.5						
			//////							
			//////							
			//////							
			//////							
			//////	10						
			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////	15						
			//////							
			//////							
			//////							
			//////							
	17.5-19.0		**00**		SS	**SAND**, GRAVEL				
			00		SS					
			00		SS					
	19.0		------		SS	**CHINLE FORMATION-SHALE**				
	TD									
				20						

Size & Type of Boring:DISPLACEMENT PROBE

Logged By: WHK



LEGEND

● Soil Boring Locations

○ Angle Soil Boring Location

50 0. 50
SCALE IN FEET

GIANT REFINERY Gallup, New Mexico	AERATION BASIN Plan View and Cross-Section Location	FIG.

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

METALS

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
Arsenic	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3
Barium	mg/kg	256	225	326	234	204	268	410	243
Beryllium	mg/kg	5.8	6.0	5.9	2.2	1.4	1.3	1.0	1.1
Cadmium	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt	mg/kg	5.7	5.6	5.8	4.9	3.6	3.1	2.9	4.0
Chromium	mg/kg	7.3	6.4	7.4	6.1	4.2	3.0	3.3	4.4
Copper	mg/kg	5.2	5.0	5.3	5.7	4.3	4.2	3.2	4.6
Mercury	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Potassium	mg/kg	1820	1780	2270	1620	1730	1100	624	1780
Nickel	mg/kg	10.9	9.8	10.4	9.0	6.5	4.6	5.1	4.6
Lead	mg/kg	13	13	11	9	8	9	7	8
Antimony	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3
Selenium	mg/kg	<0.3	<0.3	<0.3	<3	<3	<3	<3	<3
Vanadium	mg/kg	15.4	15.3	15.4	13.3	13.9	13.3	11.4	12.3
Zinc	mg/kg	15.0	14.2	15.6	13.2	10.6	8.0	12.0	11.9

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
pH	---	7.78	7.76	7.66	7.54	7.54	7.53	8.14	7.44

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

METALS

SAMPLE POINT NUMBER		03	03	03	03	03	04	04	04	04	04
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	V4.0	V9.0	E9.0 (mg/l)	V11.0	V14.0
PARAMETER	UNITS										
Arsenic	mg/kg	<3	<3	<3	<3	<3	<3	<3	<0.005	<3	<3
Barium	mg/kg	295	244	321	234	229	103	634	<0.010	249	275
Beryllium	mg/kg	2.6	2.6	2.4	2.9	4.2	2.7	3.7	<0.005	4.0	4.9
Cadmium	mg/kg	0.3	0.4	0.4	0.4	0.4	<0.3	0.4	<0.005	0.5	0.4
Cobalt	mg/kg	3.1	3.4	3.0	3.4	4.3	3.9	3.9	<0.010	4.8	4.4
Chromium	mg/kg	2.5	4.0	2.6	3.1	4.2	3.8	5.1	<0.010	3.6	5.0
Copper	mg/kg	3.9	3.5	4.0	3.8	4.4	3.9	3.8	<0.010	3.4	3.9
Mercury	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.0002	<0.02	<0.02
Potassium	mg/kg	450	697	561	623	965	1030	1260	<1.0	738	1650
Nickel	mg/kg	4.9	5.3	5.0	5.5	7.2	6.3	6.8	<0.020	5.5	7.6
Lead	mg/kg	7	7	8	7	8	6	6	<0.002	8	8
Antimony	mg/kg	<3	<3	<3	<3	<3	<3	<3	0.05	<3	<3
Selenium	mg/kg	<0.3	<3	<0.3	<3	<3	<0.3	<3	<0.005	<0.3	<3
Vanadium	mg/kg	12.3	14.2	10.0	10.6	12.2	10.8	12.4	<0.010	12.5	12.8
Zinc	mg/kg	6.2	8.5	7.2	8.2	10.6	13.0	16.7	<0.010	9.0	14.2

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

METALS

SAMPLE POINT NUMBER		05	05	05	05	05	06	06	06	06	06
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	A4.0	A9.0	A11.0	A14.0	E14.0 (mg/l)
PARAMETER	UNITS										
Arsenic	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.005
Barium	mg/kg	206	168	767	364	525	529	531	282	155	<0.010
Beryllium	mg/kg	3.5	2.7	4.7	3.1	6.5	3.4	3.9	3.6	4.3	<0.005
Cadmium	mg/kg	0.4	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	0.3	0.4	<0.005
Cobalt	mg/kg	3.9	3.5	5.1	4.6	6.9	3.9	2.9	3.1	2.9	<0.010
Chromium	mg/kg	52.1	3.3	5.8	4.4	8.2	4.8	14.5	3.3	2.5	<0.010
Copper	mg/kg	7.6	1.2	<0.5	0.9	<0.5	5.4	4.3	2.1	2.6	<0.010
Mercury	mg/kg	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.0002
Potassium	mg/kg	1500	571	2200	1440	2770	494	652	973	474	<1.0
Nickel	mg/kg	6.5	5.2	10.4	9.2	12.7	5.5	4.5	5.0	4.3	<0.020
Lead	mg/kg	8	5	7	<5	8	5	7	6	7	<0.002
Antimony	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.05
Selenium	mg/kg	<0.3	<3	<3	<3	<3	<3	<0.3	<0.3	<3	<0.005
Vanadium	mg/kg	12.0	11.5	10.3	7.3	10.7	14.8	13.3	9.1	11.9	<0.010
Zinc	mg/kg	34.6	9.7	13.9	12.5	18.7	8.0	19.9	9.0	7.3	<0.010

SMWU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8240 VOLATILE ORGANICS

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
Chloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroethane	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Acetone	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Disulfide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene (Total)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Butanone (MEK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Acetate	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachlorethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trans-1,3-Dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cis-1,3-Dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2-Hexanone (MBK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-Methyl-2-Pentanone (MIBK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachlorethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acrolein	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Acrylonitrile	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodiflouromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Iodide	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Trans-1,4-Dichloro-2-Butene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Trichloromonoflouromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-Trichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8240 VOLATILE ORGANICS

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
Ethyl Methacrylate	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Ethanol	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
2-Chloroethylvinylether	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichloro-2-Butane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

SMWU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8240 VOLATILE ORGANICS

SAMPLE POINT NUMBER		03	03	03	03	03	04	04	04	04	04
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	V4.0	V9.0	E9.0 (ug/l)	V11.0	V14.0
PARAMETER	UNITS										
Chloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Vinyl Chloride	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05
Chloroethane	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05
Methylene Chloride	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<3	<0.3	<0.3
Acetone	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	33	<0.5	<0.5
Carbon Disulfide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,1-Dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,1-Dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,2-Dichloroethene (Total)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Chloroform	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,2-Dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
2-Butanone (MEK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,1,1-Trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Carbon Tetrachloride	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Vinyl Acetate	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Bromodichloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,1,2,2-Tetrachlorethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,2-Dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Trans-1,3-Dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Trichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Dibromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,1,2-Trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Cis-1,3-Dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Bromoform	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<5	<0.3	<0.3
2-Hexanone (MBK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
4-Methyl-2-Pentanone (MIBK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Tetrachlorethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1 J	<0.5	<0.5
Chlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Styrene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Total Xylenes	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Acrolein	mg/kg	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1
Acrylonitrile	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Dibromomethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Dichlorodiflouromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
Methyl Iodide	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<0.25	<0.25
Trans-1,4-Dichloro-2-Butene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<0.25	<0.25
Trichloromonoflouromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,2,3-Trichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8240 VOLATILE ORGANICS

SAMPLE POINT NUMBER		03	03	03	03	03	04	04	04	04	04
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	V4.0	V9.0	E9.0	V11.0	V14.0
									(ug/l)		
PARAMETER	UNITS										
Ethyl Methacrylate	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<0.25	<0.25
Ethanol	mg/kg	<10	<10	<10	<10	<10	<10	<10	<100	<10	<10
Bromomethane	mg/kg	<1	<1	<1	<1	<1	<1	<1	<10	<1	<1
2-Chloroethylvinylether	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5
1,4-Dichloro-2-Butane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

SMWU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8240 VOLATILE ORGANICS

SAMPLE POINT NUMBER		05	05	05	05	05	06	06	06	06	06
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	A4.0	A9.0	A11.0	A14.0	E14.0 (ug/l)
PARAMETER	UNITS										
Chloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Vinyl Chloride	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
Chloroethane	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
Methylene Chloride	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<3
Acetone	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10
Carbon Disulfide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,1-Dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,1-Dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,2-Dichloroethene (Total)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Chloroform	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,2-Dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
2-Butanone (MEK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,1,1-Trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Carbon Tetrachloride	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Vinyl Acetate	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Bromodichloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,1,2,2-Tetrachlorethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,2-Dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Trans-1,3-Dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Trichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Dibromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,1,2-Trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Cis-1,3-Dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Bromoform	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<5
2-Hexanone (MBK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
4-Methyl-2-Pentanone (MIBK)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Tetrachlorethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Chlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Styrene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Total Xylenes	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Acrolein	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10
Acrylonitrile	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Dibromomethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Dichlorodiflouromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
Methyl Iodide	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5
Trans-1,4-Dichloro-2-Butene	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5
Trichloromonoflouromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,2,3-Trichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8240 VOLATILE ORGANICS

SAMPLE POINT NUMBER		05	05	05	05	05	06	06	06	06	06
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	A4.0	A9.0	A11.0	A14.0	E14.0 (ug/l)
PARAMETER	UNITS										
Ethyl Methacrylate	mg/kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5
Ethanol	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100
Bromomethane	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10
2-Chloroethylvinylether	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5
1,4-Dichloro-2-Butane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
N-Nitrosodimethylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Phenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Aniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bis(2-Chloroethyl)Ether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Chlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1,3-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1,4-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzyl Alcohol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1,2-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Methylphenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
Bis(2-Chloroisopropyl)Ether	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
4-Methylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
N-Nitroso-di-n-Propylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Hexachloroethane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Nitrobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Isophorene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Nitrophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,4-Dimethylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzoic Acid	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
Bis(2-Chloroethoxy)Methane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,4-Dichlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1,2,4-Trichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Naphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
4-Chloroaniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Hexachlorobutadiene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
4-Chloro-3-Methylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Methylnaphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Hexachlorocyclopentadiene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,4,6-Trichlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
2,4,5-Trichlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
2-Nitroaniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Dimethylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Acenaphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
3-Nitroaniline	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
Acenaphthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,4-Dinitrophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
4-Nitrophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
2,4-Dinitrotoluene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,6-Dinitrotoluene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Diethylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
4-Chlorophenyl-Phenylether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS, CONT.

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
Flourene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
4-Nitroaniline	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
4,6-Dinitro-2-Methylphenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
N-Nitrosodiphenylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
4-'4-Bromophenyl-Phenylether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Hexachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Pentachlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
Phenanthrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Di-n-Butylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzidine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Butylbenzylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
3,3'-Dichlorobenzidine	mg/kg	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Benzo(a)Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bis(2-Ethylhexyl)Phthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Chrysene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzo(b)Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzo(k)Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzo(a)Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Indeno(1,2,3-cd)Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Dibenzo(a,h)Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzo(g,h,i)Perylene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1-Chloronaphthane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Chloronaphthane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Dibenzo(a,j)Acridine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Di-n-Octylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1,2-Diphenylhydrazine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS, CONT.

SAMPLE POINT NUMBER		01	01	01	01	02	02	02	02
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	A4.0	A9.0	A11.0	A14.0
PARAMETER	UNITS								
Acetophenone	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
a,a-Dimethylphenethylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
4-Aminobiphenyl	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,6-Dichlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
p-(Dimethylamino)Azobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
7,12-Dimethylbenzo(a) Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Diphenylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Ethyl Methanesulfonate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
3-Methylcholanthrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Methyl Methanesulfonate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1-Naphthylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Naphtylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
N-Nitroso-di-Butylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
N-Nitrosopiperidine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Pentachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Pentachloronitrobenzene	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85
Phenacetin	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2-Picoline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Pronamide	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
1,2,4,5-Tetrachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
2,3,4,6-Tetrachlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS

SAMPLE POINT NUMBER		03	03	03	03	03	04	04	04	04	04
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	V4.0	V9.0	E9.0 (ug/l)	V11.0	V14.0
PARAMETER	UNITS										
N-Nitrosodimethylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Phenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Aniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Bis(2-Chloroethyl)Ether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Chlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1,3-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1,4-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzyl Alcohol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1,2-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Methylphenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<5	<0.85	<0.85
Bis(2-Chloroisopropyl)Ether	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<5	<0.85	<0.85
4-Methylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
N-Nitroso-di-n-Propylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Hexachloroethane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Nitrobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Isophorene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Nitrophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,4-Dimethylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzoic Acid	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
Bis(2-Chloroethoxy)Methane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,4-Dichlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1,2,4-Trichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Naphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
4-Chloroaniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Hexachlorobutadiene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
4-Chloro-3-Methylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Methylnaphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Hexachlorocyclopentadiene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,4,6-Trichlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<5	<0.85	<0.85
2,4,5-Trichlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
2-Nitroaniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<25	<0.17	<0.17
Dimethylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Acenaphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
3-Nitroaniline	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
Acenaphthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,4-Dinitrophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
4-Nitrophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
2,4-Dinitrotoluene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,6-Dinitrotoluene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Diethylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	0.9	<0.17	<0.17	<5	<0.17	<0.17
4-Chlorophenyl-Phenylether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS, CONT.

SAMPLE POINT NUMBER		03	03	03	03	03	04	04	04	04	04
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	V4.0	V9.0	E9.0 (ug/l)	V11.0	V14.0
PARAMETER	UNITS										
Flourene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
4-Nitroaniline	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
4,6-Dinitro-2-Methylphenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
N-Nitrosodiphenylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
4-'4-Bromophenyl-Phenylether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Hexachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Pentachlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
Phenanthrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Di-n-Butylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzidine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<50	<0.17	<0.17
Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Butylbenzylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
3,3'-Dichlorobenzidine	mg/kg	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<10	<0.34	<0.34
Benzo(a)Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Bis(2-Ethylhexyl)Phthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Chrysene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzo(b)Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzo(k)Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzo(a)Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Indeno(1,2,3-cd)Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Dibenzo(a,h)Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Benzo(g,h,i)Perylene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1-Chloronaphthane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Chloronaphthane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Dibenzo(a,j)Acridine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Di-n-Octylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1,2-Diphenylhydrazine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS, CONT.

SAMPLE POINT NUMBER		03	03	03	03	03	04	04	04	04	04
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	V4.0	V9.0	E9.0 (ug/l)	V11.0	V14.0
PARAMETER	UNITS										
Acetophenone	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
a,a-Dimethylphenethylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
4-Aminobiphenyl	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,6-Dichlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
p-(Dimethylamino)Azobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
7,12-Dimethylbenzo(a) Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Diphenylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Ethyl Methanesulfonate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
3-Methylcholanthrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Methyl Methanesulfonate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1-Naphthylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Naphtylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
N-Nitroso-di-Butylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
N-Nitrosopiperidine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Pentachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Pentachloronitrobenzene	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85
Phenacetin	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2-Picoline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
Pronamide	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
1,2,4,5-Tetrachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5	<0.17	<0.17
2,3,4,6-Tetrachlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25	<0.85	<0.85

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS

SAMPLE POINT NUMBER		05	05	05	05	05	06	06	06	06	06
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	A4.0	A9.0	A11.0	A14.0	E14.0
PARAMETER	UNITS										(ug/l)
N-Nitrosodimethylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Phenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Aniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Bis(2-Chloroethyl)Ether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Chlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1,3-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1,4-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzyl Alcohol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1,2-Dichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Methylphenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<5
Bis(2-Chloroisopropyl)Ether	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<5
4-Methylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
N-Nitroso-di-n-Propylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Hexachloroethane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Nitrobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Isophorene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Nitrophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,4-Dimethylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzoic Acid	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
Bis(2-Chloroethoxy)Methane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,4-Dichlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1,2,4-Trichlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Naphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
4-Chloroaniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Hexachlorobutadiene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
4-Chloro-3-Methylphenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Methylnaphthalene	mg/kg	<0.17	<0.17	0.21	<0.17	0.33	<0.17	<0.17	<0.17	<0.17	<5
Hexachlorocyclopentadiene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,4,6-Trichlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<5
2,4,5-Trichlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
2-Nitroaniline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<25
Dimethylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Acenaphthalene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
3-Nitroaniline	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
Acenaphthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,4-Dinitrophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
4-Nitrophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
2,4-Dinitrotoluene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,6-Dinitrotoluene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Diethylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
4-Chlorophenyl-Phenylether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS, CONT.

SAMPLE POINT NUMBER		05	05	05	05	05	06	06	06	06	06
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	A4.0	A9.0	A11.0	A14.0	E14.0
PARAMETER	UNITS										(ug/l)
Flourene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
4-Nitroaniline	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
4,6-Dinitro-2-Methylphenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
N-Nitrosodiphenylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
4-'4-Bromophenyl-Phenylether	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Hexachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Pentachlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
Phenanthrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Di-n-Butylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	0.26	<5
Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzidine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<50
Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Butylbenzylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
3,3'-Dichlorobenzidine	mg/kg	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<10
Benzo(a)Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Bis(2-Ethylhexyl)Phthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Chrysene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzo(b)Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzo(k)Flouranthene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzo(a)Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Indeno(1,2,3-cd)Pyrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Dibenzo(a,h)Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Benzo(g,h,i)Perylene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1-Chloronaphthane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Chloronaphthane	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Dibenzo(a,j)Acridine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Di-n-Octylphthalate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1,2-Diphenylhydrazine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5

SWMU #1

PHASE II, RFI 1991
GIANT REFINING
CINIZA

8270 SEMI-VOLATILE ORGANICS, CONT.

SAMPLE POINT NUMBER		05	05	05	05	05	06	06	06	06	06
SAMPLE POINT DEPTH		V4.0	V9.0	V11.0	V14.0	D14.0	A4.0	A9.0	A11.0	A14.0	E14.0
PARAMETER	UNITS										(ug/l)
Acetophenone	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
a,a-Dimethylphenethylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
4-Aminobiphenyl	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,6-Dichlorophenol	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
p-(Dimethylamino)Azobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
7,12-Dimethylbenzo(a) Anthracene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Diphenylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Ethyl Methanesulfonate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
3-Methylcholanthrene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Methyl Methanesulfonate	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1-Naphthylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Naphtylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
N-Nitroso-di-Butylamine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
N-Nitrosopiperidine	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Pentachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Pentachloronitrobenzene	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25
Phenacetin	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2-Picoline	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
Pronamide	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
1,2,4,5-Tetrachlorobenzene	mg/kg	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<5
2,3,4,6-Tetrachlorophenol	mg/kg	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<25

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505.
722.3833

March 20, 1997

Mr. Benito Garcia, Bureau Chief
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
2044 Galisteo
P. O. Box 26110
Santa Fe, New Mexico 87502

SUBJECT: QUARTERLY PROGRESS REPORT - 4th Quarter, 1996 and 1st Quarter, 1997

Dear Mr. Garcia:

Pursuant to Giant's **HSWA Permit Condition C.4., Page 11** and the May 31, 1990, **RFI Workplan Approval,** Giant Refining Company is submitting information for the fourth Quarter of 1996 and the first Quarter of 1997.

SWMU 6 - Tank Farm / Tank 569 :

A letter was submitted to Mr. Patricio Sanchez of the Oil Conservation Division (OCD) on November 25, 1996. The office of the HRMB was copied on this correspondence which addressed the borings completed between 8/22/96 and 9/9/96. Submitted with that letter were the following items: Boring Logs for borings 0643 through 0650, Well Installation Diagrams for OW-29 and OW-30, analytical results from soil and groundwater samples, and a site map indicating all borings done to date.

Free product and groundwater recovery from the Tank 569 area has begun. The boring originally identified as B-2 was completed as a well and designated as OW-27. This well is now called RW-1.

Giant has received verbal permission from the owner to do soil borings and sample groundwater on his property. This project is now in the planning stage. Boring Logs and analytical results will be forwarded to your office as soon as they are available.

SWMU 1 - Aeration Lagoons :

As reported in the Quarterly Progress Report submitted 9/10/96, several samples taken at the perimeter of the Aeration Lagoons showed the possible presence of some volatile organic compounds. Confirmatory samples were taken on 2/18/97. The analytical results are provided with this report. One sample showed a small amount of ethylbenzene (below NM Groundwater Standards). All other results were Not Detected (ND).

SWMU 13 - Drainage Ditch :

As part of the "No Further Action" Approval with Modifications for SWMU -13 (Drainage Ditch), the EPA, in it's 8/24/94 correspondence to Giant, directed that additional sampling be performed every 5 years. The required samples were to be drilled at an angle with soil from the 6 - 6 ½ foot depth sent for analysis. Volatile Organic Compounds, Semi-Volatile Compounds, and metals were analyzed on the three samples taken. Enclosed are the analytical results for the first 5 year sampling event, which was performed 10/23/96. A diagram indicating the sample points is also enclosed. No volatile or semi-volatile compounds were detected. Metal results are comparable (or lower) that those found in the original RFI work.

If you have questions or concerns regarding this report, please do not hesitate to call me at (505) 722-0217 or Dorinda Mancini at (505) 722-0227.

"I certify under penalty of law that this document and all attachments were prepared under my direction to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sincerely

David C. Pavlich

David Pavlich, HSE Manager
Giant Refining Company

cc: Kim Bullerdick, Corporate Counsel, Giant Industries Arizona, Inc.
Dick Platt, General Manager, Ciniza Refinery
Dorinda Mancini, Environmental Manager, Ciniza Refinery
Steve Morris, Environmental Specialist, Ciniza Refinery
Patricio Sanchez, Petroleum Engineer, OCD

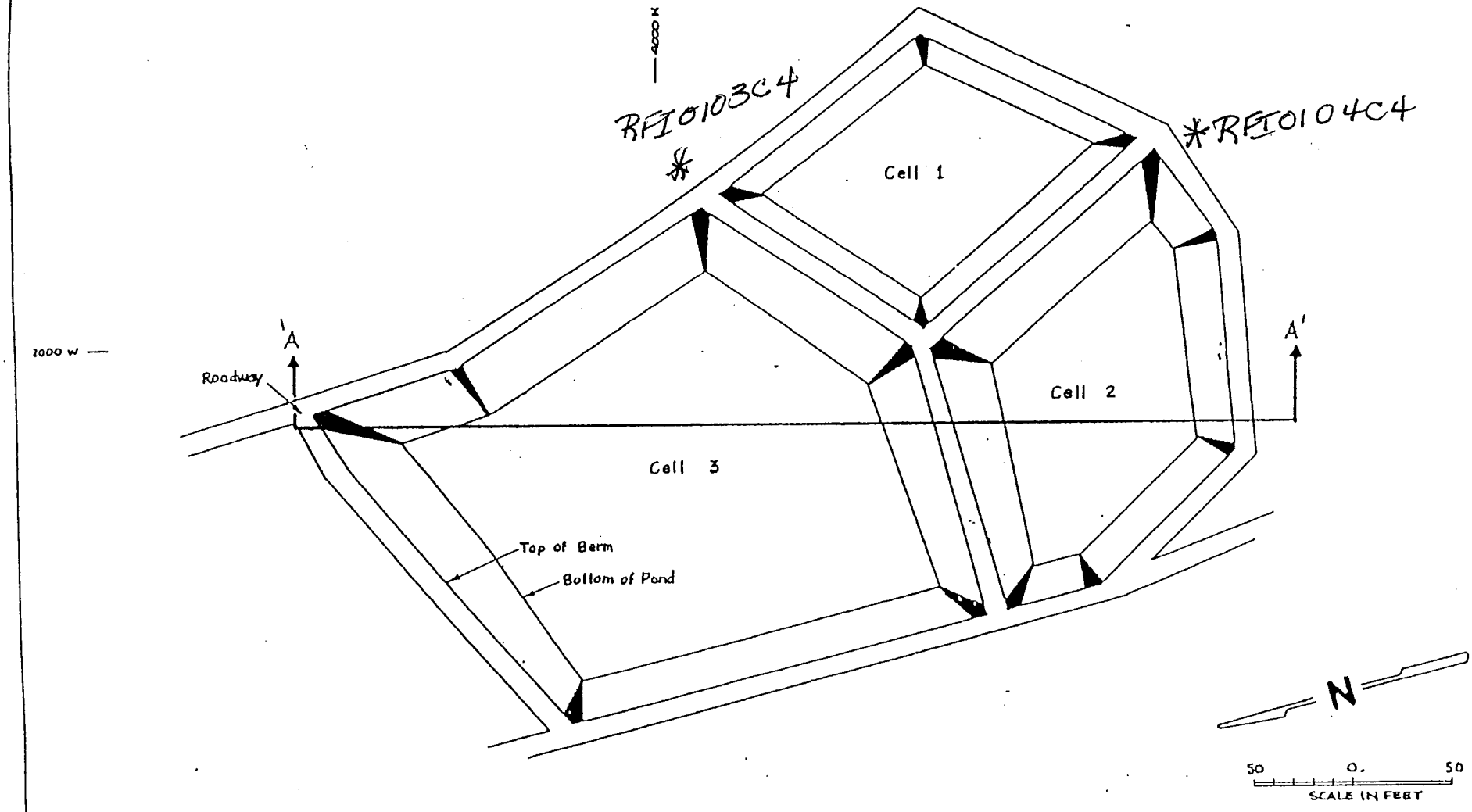
RFI1Q97

GIANT

REFINING CO.

SWMU-1 AERATION LAGOONS ANALYTICAL RESULTS

RFI QUARTERLY PROGRESS REPORT
4TH QTR. 96, 1ST QTR 97



GIANT REFINERY Gallup, New Mexico	AERATION BASIN Plan View and Cross-Section Location	FIG.

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59718

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY	Date Reported:	03/17/97
Sample ID:	RFI0103C4	Date Sampled:	02/18/97
Project ID:	Ciniza	Date Received:	02/20/97
Lab ID:	B970821	Date Extracted:	02/28/97
Matrix:	Soil	Date Analyzed:	03/03/97

Parameter	Result	PQL	Units
Toluene	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	110	70 - 121
Bromofluorobenzene	99	74 - 121
Toluene-d8	111	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.O.

Reviewed CRB

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59718

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		
Sample ID:	RFI0104C4	Date Reported:	03/17/97
Project ID:	Ciniza	Date Sampled:	02/18/97
Lab ID:	B970822	Date Received:	02/20/97
Matrix:	Soil	Date Extracted:	02/28/97
		Date Analyzed:	03/03/97

Parameter	Result	PQL	Units
Ethylbenzene	0.61	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	110	70 - 121
Bromofluorobenzene	107	74 - 121
Toluene-d8	112	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.O.

Reviewed CRB

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59718

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	**GIANT REFINING COMPANY**		
Sample ID:	Trip Blank	Date Reported:	03/10/97
Project ID:	Ciniza	Date Sampled:	02/18/97
Lab ID:	B970823	Date Received:	02/20/97
Matrix:	Water	Date Extracted:	NA
		Date Analyzed:	03/03/97

Parameter	Result	PQL	Units
Ethylbenzene	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
Xylenes (total)	ND	5.0	ug/L

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	116	81 - 126
Bromofluorobenzene	104	78 - 112
Toluene-d8	100	83 - 127

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst E.D.

Reviewed

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59718

LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: 03/03/97
Lab ID: MBS97059
Matrix: Soil
Date Extracted: 02/28/97

Parameter	Result	PQL	Units
Toluene	ND	0.2	mg/kg
Xylenes (total)	ND	0.2	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	114	80 - 120
Bromofluorobenzene	108	74 - 121
Toluene-d8	124 #	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)
- Surrogate Recovery not within control limits.

Analyst E.D.

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59718

LAB QA/QC
EPA METHOD 8260
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: 03/03/97
Lab ID: 0597H00821
Matrix: Soil
Date Extracted: 02/28/97

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %		QC Limits Rec.
1,1-Dichloroethene	12.5	0	8.58	69	*	75 - 145
Benzene	12.5	0	10.4	83		71 - 120
Chlorobenzene	12.5	0	11.4	91		76 - 127
Toluene	12.5	0.33	13.3	104		71 - 127
Trichloroethene (TCE)	12.5	0	10.6	85		75 - 130

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	MSD Result (mg/kg)	MSD Recovery %	RPD %		QC Limits RPD	QC Limits Rec.
1,1-Dichloroethene	12.5	10.8	86	23	*	22	75 - 145
Benzene	12.5	12.3	98	17		24	71 - 120
Chlorobenzene	12.5	13.1	105	14		21	76 - 127
Toluene	12.5	15.8	124	17		21	71 - 127
Trichloroethene (TCE)	12.5	12.7	102	18		21	75 - 130

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 1 out of 10 outside QC limits.
RPD: 1 out of 5 outside QC limits.

Analyst E.D.

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59718

B QA/QC
A METHOD 8260
LAB CONTROL SAMPLE

Date Analyzed: 03/03/97
Lab ID: LCS97059
Matrix: Soil
Date Extracted 02/28/97

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	LCS Result (mg/kg)	LCS Recovery %	QC Limits Rec.
1,4-Dichlorobenzene	2.0	0	2.4	120	70 -130
1,1,2-Trichloroethane	2.0	0	2.2	110	70 -130
1,2-Dibromoethane (EDB)	2.0	0	1.6	80	70 -130
1,2-Dichloroethane	2.0	0	2.4	120	70 -130
1,2-Dichloropropane	2.0	0	1.7	85	70 -130
Benzene	2.0	0	2.0	100	70 -130
Bromoform	2.0	0	1.7	85	70 -130
rbon Tetrachloride	2.0	0	1.9	95	70 -130
cis-1,3-Dichloropropene	2.0	0	2.2	110	70 -130
Tetrachloroethene (PCE)	2.0	0	1.8	90	70 -130
Trichloroethene (TCE)	2.0	0	2.1	105	70 -130
Vinyl Chloride	2.0	0	2.9	145 *	70 -130

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
Bromofluorobenzene	109	74 -121
1,2-Dichloroethane-d4	113	70 -121
Toluene-d8	118 #	81 -117

Spike Recovery: 1 out of 12 outside QC limits.
Surrogates: Surrogate Recovery affected by Matrix Effect.

Analyst E.D.

Reviewed

imi
Inter- Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
GIANT Refining Co - RFI Resample	CINIZA

Sampler: (Signature) [signature]

Chain of Custody Tape No.

ANALYSES / PARAMETERS

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	8260 Toluene Xylenes (TOTAL)	8260 BENZ Xylenes (TOTAL)			Remarks
RFI 0103C4	2/18/97	0945	B9700821	Soil	1	✓				on ice
RFI 0104C4	"	0925	B9700822	"	1		✓			<4°C
TRIP BLANK			B9700823	WATER	1					
										TRIP BLANK
										1/2" head space

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	2/18/97	0900			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time
FEDEX (courier)			Susan Y. Hetridge	2/20/97	1235

Inter-Mountain Laboratories, Inc.

☐ 1633 Terra Avenue, Sheridan, Wyoming 82801, Telephone (307) 672-8945

☐ 1701 Phillips Circle, Gillette, Wyoming 82718, Telephone (307) 682-8945

☒ 2506 West Main Street, Farmington, NM 87401, Telephone (505) 326-[illegible]737

☒ 1160 Research Dr., Bozeman, Montana 59715, Telephone (406) 586-8450

☐ 11183 SH 30, College Station, TX 77845, Telephone (409) 776-8945

43578

GIANT
REFINING CO.

Route 3, Box 7
Gallup, New Mexico
87301

505
722-3833

September 10, 1996

Mr. Benito Garcia, Bureau Chief
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Mr. Garcia:

SUBJECT: QUARTERLY PROGRESS REPORT - 2nd and 3rd Quarters, 1996.

Pursuant to Giant's **HSWA Permit Condition C.4., Page 11** and the May 31, 1990, **RFI Workplan Approval,** Giant Refining Company is submitting additional information for the second quarter (this is in addition to the April 16, 1996 Second Quarter Report) as well as information regarding the progress made during the third quarter of 1996.

As reported at the beginning of the second quarter of 1996, Mr. Bill Kingsley, Precision Engineering, has completed three additional soil borings at this site. The information gathered from the drilling and logging of those holes is being used by Mr. Kingsley to construct a geologic cross-section and modeling program for the Ciniza Refinery.

Giant informed Mr. James Harris, Jr., USEPA, in a letter dated April 16, 1996, that Giant had submitted a Corrective Action Plan (CAP) to the New Mexico Oil Conservation Division (NMOCD) for the recovery of "free product" from the area identified as Solid Waste Management Unit Six (SWMU-6). As a result of the CAP submittal, the New Mexico Environment Department, Hazardous and Radioactive Materials Bureau (HRMB) informed Giant that New Mexico is now an "Authorized State" for dealing with corrective action under the Hazardous and Solid Waste Act (HSWA) and that all future correspondence associated with corrective action activities should be directed to HRMB.

On June 20, 1996, the NMOCD, the HRMB, and the USEPA informed Giant that there were some areas of the CAP that needed to be addressed. On September 4,1996 Giant transmitted a letter in response to the June 20, 1996 letter. As explained in the September 4, 1996 letter, six (6) borings were to be drilled, samples taken every two (2) feet, and, if field screening indicated the presence hydrocarbons, samples were to be analyzed for BTEX. Once this program has been completed and analytical results received, Giant will provide a written update to the regulatory agencies on its findings around SWMU-6.

In addition to the activities associated with SWMU-6, Giant has conducted a drilling and sampling program on the Aeration Lagoons (SWMU-1) . Six (6) boreholes were drilled to a depth of 25 feet. Soil samples were taken from 4 feet, 9 feet, 11 feet, 14 feet and 20 feet, as required by EPA (see attached section identified as EPA-Requirements). All

samples were sent off to an independent laboratory for analysis. Results from this activity are found in the attachment identified as "SWMU-1 1996 SOIL BORING AND ANALYTICAL RESULTS".

In reviewing the sample analysis results from SWMU-1, it has been noted that sample numbers RFI0103A4 and RFI0104A4 indicated the possible presence of some volatile organic compounds. Questions about the validity of these two sample results have been raised; and, in an effort to resolve these questions, Giant will re-sample these two locations during the fourth quarter of 1996.

If there are any question regarding the above, please feel free to contact me at (505) 722-0217.

"I certify under penalty of law that this document and all attachments were prepared under my direction to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Sincerely

David C. Pavlich

David C. Pavlich
HSE Manager
Giant Refining Company

Enc.

cc: Kim Bullerdick, Corporate Counsel,
Giant Industries Arizona, Inc. w/o enc.
Dick Platt, General Manager,
Giant Refining Company w/o enc.
Edward L. Horst, Environmental Manager,
Giant Refining Company
Steve Morris, Environmental Specialist
Giant Refining Company

RFI3Q96.DOC

SWMU-1 1996 SOIL BORING AND ANALYTICAL RESULTS

GIANT REFINING COMPANY

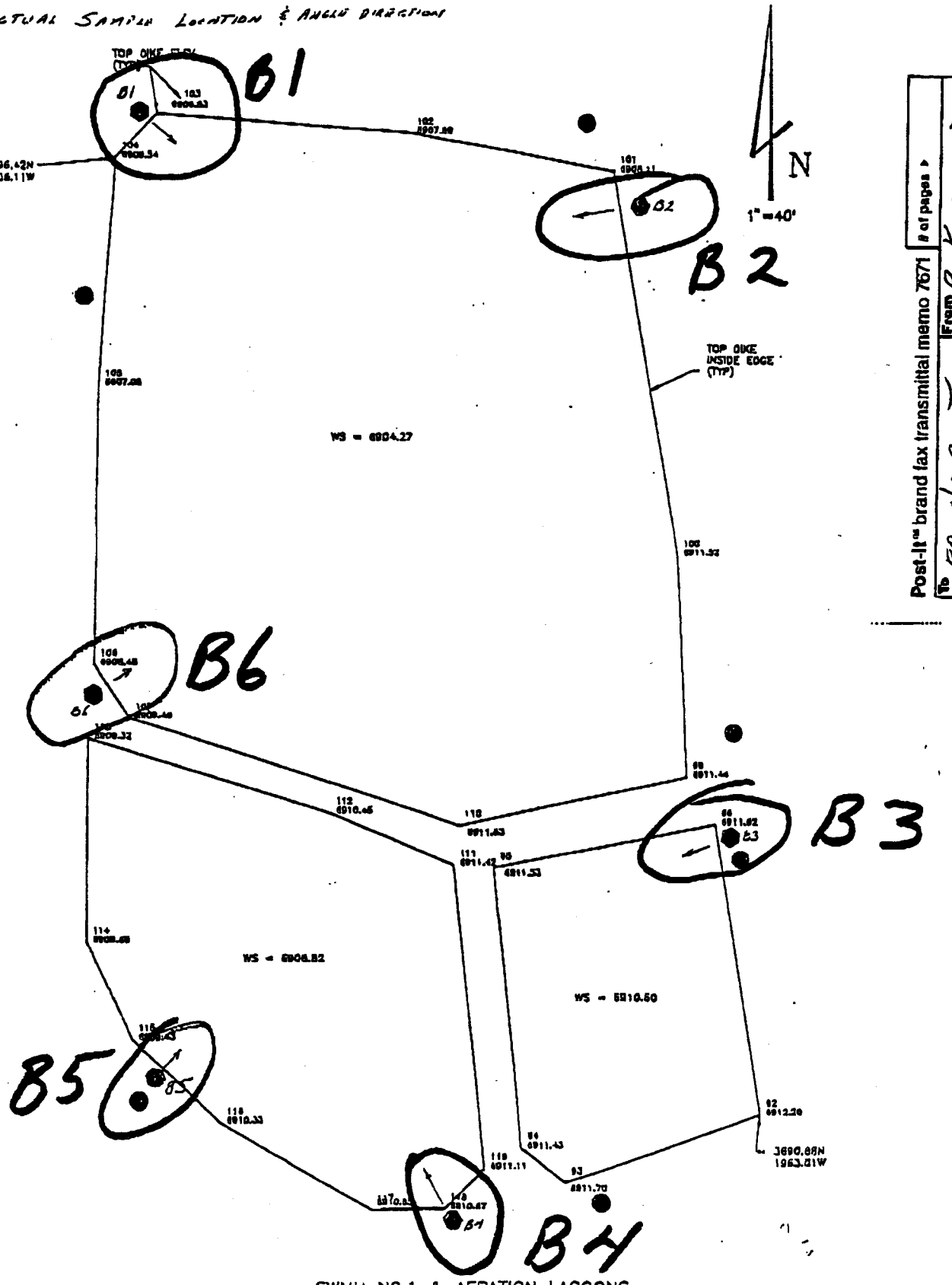
RFI QUARTERLY PROGRESS REPORT, 2ND., 3RD. QTR 1996

ED - FYI

● — Proposed & soil Boring EDA SWMU "1" 96"

Samples Taken ⊗
4', 9', 11', 14' and 21'

● — Actual Sample Location & Angle Direction



SWMU NO.1 & AERATION LAGOONS

Post-It™ brand fax transmittal memo 7671 | # of pages ▸

To ED HORST	From B. Kimbrell		
Co.	Co.		
Dept.	Phone #		
Fax #	Fax #		

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

CASE NARRATIVE

Client: GIANT REFINING COMPANY
Project: SWMU #1 Received on: 06/19/96
Set ID: 0596H04586 # samples: 27

Suites: Giant Refining 8240, Giant Refining 8270, M+ Total

Samples were received for analysis at Inter-Mountain Laboratories (IML), Bozeman, Montana. Enclosed are the results of these analyses.

Limits of detection for each instrument/analysis are determined by sample matrix effects, instrument performance under standard conditions, and dilution requirements to maintain chromatography output within calibration ranges. Quantitations have been calculated on an as received basis.

Antimony spike results are reported from a post digestion analytical spike. Matrix spike recoveries were greater than fifty percent generating the necessity for the post digestion analysis.

Scott Rogers
IML-Bozeman

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A4		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964586	0396G01025	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A4		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964586	0396G01025	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	100	80 - 120
Bromofluorobenzene	90	74 - 121
Toluene-d8	105	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst RRD

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client: GIANT REFINING COMPANY
Sample ID: RFI0101A4
Project ID: SWMU #1
Lab ID: B964586 0396G01025
Matrix: Soil

Date Reported: 07/07/96
Date Sampled: 06/12/96
Date Received: 06/19/96
Date Extracted: 06/25/96
Date Analyzed: 06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964586	0396G01025	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	61	19 - 122
2-Fluorobiphenyl	59	30 - 115
2-Fluorophenol	50	25 - 121
Nitrobenzene-d5	56	23 - 120
Phenol-d6	55	24 - 113
Terphenyl-d14	58	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RBD

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0101A9
Project ID: SWMU #1
Lab ID: B964587 0396G01026
Matrix: Soil

Date Reported: 07/05/96
Date Sampled: 06/12/96
Date Received: 06/19/96
Date Extracted: 06/26/96
Date Analyzed: 06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A9		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964587	0396G01026	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	110	80 - 120
Bromofluorobenzene	89	74 - 121
Toluene-d8	90	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964587	0396G01026	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964587	0396G01026	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	70	19 - 122
2-Fluorobiphenyl	75	30 - 115
2-Fluorophenol	58	25 - 121
Nitrobenzene-d5	65	23 - 120
Phenol-d6	60	24 - 113
Terphenyl-d14	60	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0101A11
Project ID: SWMU #1
Lab ID: B964588 0396G01027
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/12/96
Date Received: 06/19/96
Date Extracted: 06/26/96
Date Analyzed: 06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A11		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964588	0396G01027	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	113	80 - 120
Bromofluorobenzene	86	74 - 121
Toluene-d8	99	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client: GIANT REFINING COMPANY
Sample ID: RFI0101A11
Project ID: SWMU #1
Lab ID: B964588 0396G01027
Matrix: Soil

Date Reported: 07/07/96
Date Sampled: 06/12/96
Date Received: 06/19/96
Date Extracted: 06/25/96
Date Analyzed: 06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0101A11		Date Sampled:	06/12/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964588	0396G01027	Date Extracted:	06/25/96
Matrix:	Soil		Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	64	19 - 122
2-Fluorobiphenyl	59	30 - 115
2-Fluorophenol	49	25 - 121
Nitrobenzene-d5	55	23 - 120
Phenol-d6	55	24 - 113
Terphenyl-d14	59	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: GIANT REFINING COMPANY
Sample ID: RFI0101A11
Project ID: SWMU #1
Lab ID: B964588 0396G01027
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/12/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	2.1	0.25	mg/kg
Barium, Total	06/29/96	600	10	mg/kg
Beryllium, Total	06/29/96	0.62	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	6.8	1.0	mg/kg
Cobalt, Total	06/29/96	4.0	1.0	mg/kg
Copper, Total	06/29/96	6.1	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	9.7	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	19	1.0	mg/kg
Zinc, Total	06/29/96	21	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A14		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964589	0396G01028	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	**GIANT REFINING COMPANY**			
Sample ID:	RFI0101A14		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964589	0396G01028	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	**%**	**QC Limits**
1,2-Dichloroethane-d4	114	80 - 120
Bromofluorobenzene	93	74 - 121
Toluene-d8	109	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ **Reviewed** _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964589	0396G01028	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964589	0396G01028	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	63	19 - 122
2-Fluorobiphenyl	60	30 - 115
2-Fluorophenol	50	25 - 121
Nitrobenzene-d5	55	23 - 120
Phenol-d6	53	24 - 113
Terphenyl-d14	60	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0101A14
Project ID: SWMU #1
Lab ID: B964589 0396G01028
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/12/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.8	0.25	mg/kg
Barium, Total	06/29/96	470	10	mg/kg
Beryllium, Total	06/29/96	0.49	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	6.1	1.0	mg/kg
Cobalt, Total	06/29/96	3.2	1.0	mg/kg
Copper, Total	06/29/96	3.8	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	56	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	15	1.0	mg/kg
Zinc, Total	06/29/96	17	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A20		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964590	0396G01029	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A20		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964590	0396G01029	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	102	80 - 120
Bromofluorobenzene	94	74 - 121
Toluene-d8	105	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A20		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964590	0396G01029	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0101A20		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/12/96
Lab ID:	B964590	0396G01029	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	59	19 - 122
2-Fluorobiphenyl	56	30 - 115
2-Fluorophenol	45	25 - 121
Nitrobenzene-d5	52	23 - 120
Phenol-d6	50	24 - 113
Terphenyl-d14	55	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RR

Reviewed WS

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0101A20
Project ID: SWMU #1
Lab ID: B964590 0396G01029
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/12/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.2	0.25	mg/kg
Barium, Total	06/29/96	620	10	mg/kg
Beryllium, Total	06/29/96	0.66	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	10	1.0	mg/kg
Cobalt, Total	06/29/96	6.4	1.0	mg/kg
Copper, Total	06/29/96	ND	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Nickel, Total	06/29/96	13	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	27	1.0	mg/kg
Zinc, Total	06/29/96	28	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A4		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964591	0396G01030	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A4		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964591	0396G01030	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	98	80 - 120
Bromofluorobenzene	93	74 - 121
Toluene-d8	114	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964591	0396G01030	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	2.0	mg/kg
2,4-Dimethylphenol	ND	2.0	mg/kg
2,4-Dinitrophenol	ND	4.0	mg/kg
2-Methylphenol	ND	2.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	2.0	mg/kg
4-Nitrophenol	ND	4.0	mg/kg
6-Methyl chrysene	ND	4.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	4.0	mg/kg
Anthracene	ND	2.0	mg/kg
Benzenethiol (Thiophenol)	ND	2.0	mg/kg
Benzo(a)anthracene	ND	2.0	mg/kg
Benzo(a)pyrene	ND	2.0	mg/kg
Benzo(b)fluoranthene	ND	2.0	mg/kg
Benzo(k)fluoranthene	ND	2.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	10	mg/kg
Butylbenzylphthalate	ND	2.0	mg/kg
Chrysene	ND	2.0	mg/kg
Di-n-Butylphthalate	ND	10	mg/kg
Di-n-Octylphthalate	ND	10	mg/kg
Dibenz(a,h)anthracene	ND	2.0	mg/kg
Dichlorobenzenes (total)	ND	6.0	mg/kg
Diethylphthalate	ND	2.0	mg/kg
Dimethylphthalate	ND	2.0	mg/kg
Fluoranthene	ND	2.0	mg/kg
Indene	ND	2.0	mg/kg
Naphthalene	ND	2.0	mg/kg
Phenanthrene	ND	2.0	mg/kg
Phenol	ND	2.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964591	0396G01030	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	2.0	mg/kg
Pyridine	ND	4.0	mg/kg
Quinoline	ND	2.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	34	19 - 122
2-Fluorobiphenyl	34	30 - 115
2-Fluorophenol	30	25 - 121
Nitrobenzene-d5	36	23 - 120
Phenol-d6	34	24 - 113
Terphenyl-d14	34	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0102A4
Project ID: SWMU #1
Lab ID: B964591 0396G01030
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	0.75	0.25	mg/kg
Barium, Total	06/29/96	450	10	mg/kg
Beryllium, Total	06/29/96	0.83	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	30	1.0	mg/kg
Cobalt, Total	06/29/96	5.8	1.0	mg/kg
Copper, Total	06/29/96	6.4	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	12	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	30	1.0	mg/kg
Zinc, Total	06/29/96	39	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A9		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964592	0396G01031	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A9		Date Reported:	07/05/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964592	0396G01031	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%		QC Limits
1,2-Dichloroethane-d4	96		80 - 120
Bromofluorobenzene	95		74 - 121
Toluene-d8	124	##	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)
- Surrogate Recovery not within control limits due to matrix/dilution effect.

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964592	0396G01031	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964592	0396G01031	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	63	19 - 122
2-Fluorobiphenyl	67	30 - 115
2-Fluorophenol	58	25 - 121
Nitrobenzene-d5	63	23 - 120
Phenol-d6	62	24 - 113
Terphenyl-d14	56	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RAD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: GIANT REFINING COMPANY
Sample ID: RFI0102A9
Project ID: SWMU #1
Lab ID: B964592 0396G01031
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.5	0.25	mg/kg
Barium, Total	06/29/96	600	10	mg/kg
Beryllium, Total	06/29/96	0.57	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	10	1.0	mg/kg
Cobalt, Total	06/29/96	4.1	1.0	mg/kg
Copper, Total	06/29/96	3.8	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.1	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	20	1.0	mg/kg
Zinc, Total	06/29/96	21	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A11		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964593	0396G01032	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A11		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964593	0396G01032	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	06/26/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	98	80 - 120
Bromofluorobenzene	109	74 - 121
Toluene-d8	89	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964593	0396G01032	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0102A11		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964593	0396G01032	Date Extracted:	06/25/96
Matrix:	Soil		Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	62	19 - 122
2-Fluorobiphenyl	65	30 - 115
2-Fluorophenol	52	25 - 121
Nitrobenzene-d5	59	23 - 120
Phenol-d6	55	24 - 113
Terphenyl-d14	56	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0102A11
Project ID: SWMU #1
Lab ID: B964593 0396G01032
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	2.6	0.25	mg/kg
Barium, Total	06/29/96	430	10	mg/kg
Beryllium, Total	06/29/96	0.74	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	6.9	1.0	mg/kg
Cobalt, Total	06/29/96	4.5	1.0	mg/kg
Copper, Total	06/29/96	4.4	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.9	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	21	1.0	mg/kg
Zinc, Total	06/29/96	15	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964593	0396G01032	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/27/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	62	19 - 122
2-Fluorobiphenyl	65	30 - 115
2-Fluorophenol	52	25 - 121
Nitrobenzene-d5	59	23 - 120
Phenol-d6	55	24 - 113
Terphenyl-d14	56	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed LS

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0102A11
Project ID: SWMU #1
Lab ID: B964593 0396G01032
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	2.6	0.25	mg/kg
Barium, Total	06/29/96	430	10	mg/kg
Beryllium, Total	06/29/96	0.74	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	6.9	1.0	mg/kg
Cobalt, Total	06/29/96	4.5	1.0	mg/kg
Copper, Total	06/29/96	4.4	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.9	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	21	1.0	mg/kg
Zinc, Total	06/29/96	15	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A14		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964594	0396G01033	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A14		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964594	0396G01033	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	114	80 - 120
Bromofluorobenzene	87	74 - 121
Toluene-d8	93	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964594	0396G01033	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0102A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964594	0396G01033	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	63	19 - 122
2-Fluorobiphenyl	66	30 - 115
2-Fluorophenol	54	25 - 121
Nitrobenzene-d5	65	23 - 120
Phenol-d6	60	24 - 113
Terphenyl-d14	58	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

Inter·Mountain Laboratories, Inc.

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0102A14
Project ID: SWMU #1
Lab ID: B964594 0396G01033
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	2.5	0.25	mg/kg
Barium, Total	06/29/96	410	10	mg/kg
Beryllium, Total	06/29/96	0.44	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	5.2	1.0	mg/kg
Cobalt, Total	06/29/96	3.1	1.0	mg/kg
Copper, Total	06/29/96	2.6	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	5.9	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	17	1.0	mg/kg
Zinc, Total	06/29/96	15	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A4		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964595	0396G01034	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A4		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964595	0396G01034	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	1.3	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	0.5	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	105	80 - 120
Bromofluorobenzene	96	74 - 121
Toluene-d8	103	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964595	0396G01034	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964595	0396G01034	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	67	19 - 122
2-Fluorobiphenyl	64	30 - 115
2-Fluorophenol	61	25 - 121
Nitrobenzene-d5	67	23 - 120
Phenol-d6	60	24 - 113
Terphenyl-d14	55	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRA

Reviewed WS

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Bozeman, Montana 59715

TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0103A4
Project ID: SWMU #1
Lab ID: B964595 0396G01034
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.6	0.25	mg/kg
Barium, Total	06/29/96	370	10	mg/kg
Beryllium, Total	06/29/96	0.88	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	8.2	1.0	mg/kg
Cobalt, Total	06/29/96	4.1	1.0	mg/kg
Copper, Total	06/29/96	4.7	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.8	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	18	1.0	mg/kg
Zinc, Total	06/29/96	20	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0103A9
Project ID: SWMU #1
Lab ID: B964596 0396G01035
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A9		Date Reported:	07/11/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964596	0396G01035	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	**GIANT REFINING COMPANY**			
Sample ID:	RFI0103A9		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964596	0396G01035	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%		**QC Limits**
1,2-Dichloroethane-d4	108		80 - 120
Bromofluorobenzene	96		74 - 121
Toluene-d8	118	#	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)
- Surrogate Recovery not within control limits.

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A9		Date Reported:	07/11/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964596	0396G01035	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

1160 Research Drive
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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A9		Date Reported:	07/11/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964596	0396G01035	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	62	19 - 122
2-Fluorobiphenyl	47	30 - 115
.-Fluorophenol	40	25 - 121
Nitrobenzene-d5	50	23 - 120
Phenol-d6	45	24 - 113
Terphenyl-d14	58	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
Sample reanalyzed due to original surrogate failure. Results for confirmational use only.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RPD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0103A9
Project ID: SWMU #1
Lab ID: B964596 0396G01035
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	2.0	0.25	mg/kg
Barium, Total	06/29/96	620	10	mg/kg
Beryllium, Total	06/29/96	0.82	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	10	1.0	mg/kg
Cobalt, Total	06/29/96	4.5	1.0	mg/kg
Copper, Total	06/29/96	5.0	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	8.3	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	23	1.0	mg/kg
Zinc, Total	06/29/96	19	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A11		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964597	0396G01036	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A11		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964597	0396G01036	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	100	80 - 120
Bromofluorobenzene	95	74 - 121
Toluene-d8	97	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964597	0396G01036	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964597	0396G01036	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	56	19 - 122
2-Fluorobiphenyl	50	30 - 115
2-Fluorophenol	42	25 - 121
Nitrobenzene-d5	54	23 - 120
Phenol-d6	47	24 - 113
Terphenyl-d14	54	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

Inter·Mountain Laboratories, Inc.

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0103A11
Project ID: SWMU #1
Lab ID: B964597 0396G01036
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.3	0.25	mg/kg
Barium, Total	06/29/96	460	10	mg/kg
Beryllium, Total	06/29/96	0.57	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	6.9	1.0	mg/kg
Cobalt, Total	06/29/96	4.2	1.0	mg/kg
Copper, Total	06/29/96	3.9	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.4	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	17	1.0	mg/kg
Zinc, Total	06/29/96	20	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A14		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964598	0396G01037	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A14		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964598	0396G01037	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	98	80 - 120
Bromofluorobenzene	93	74 - 121
Toluene-d8	106	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964598	0396G01037	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

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Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0103A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964598	0396G01037	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	64	19 - 122
2-Fluorobiphenyl	62	30 - 115
2-Fluorophenol	56	25 - 121
Nitrobenzene-d5	67	23 - 120
Phenol-d6	63	24 - 113
Terphenyl-d14	59	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0103A14
Project ID: SWMU #1
Lab ID: B964598 0396G01037
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.7	0.25	mg/kg
Barium, Total	06/29/96	460	10	mg/kg
Beryllium, Total	06/29/96	0.64	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	9.9	1.0	mg/kg
Cobalt, Total	06/29/96	4.8	1.0	mg/kg
Copper, Total	06/29/96	3.3	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	8.5	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	23	1.0	mg/kg
Zinc, Total	06/29/96	20	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst

Reviewed

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A4		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964599	0396G01038	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

Inter·Mountain Laboratories, Inc.

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Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0104A4
Project ID: SWMU #1
Lab ID: B964599 0396G01038
Matrix: Soil

Date Reported: 07/11/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A4		Date Reported:	07/11/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964599	0396G01038	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	1.7	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	2.2	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	99	80 - 120
Bromofluorobenzene	101	74 - 121
Toluene-d8	88	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964599	0396G01038	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	10	mg/kg
2,4-Dimethylphenol	ND	10	mg/kg
2,4-Dinitrophenol	ND	20	mg/kg
2-Methylphenol	ND	10	mg/kg
3-Methylphenol/4-Methylphenol	ND	10	mg/kg
4-Nitrophenol	ND	20	mg/kg
6-Methyl chrysene	ND	20	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	20	mg/kg
Anthracene	ND	10	mg/kg
Benzenethiol (Thiophenol)	ND	10	mg/kg
Benzo(a)anthracene	ND	10	mg/kg
Benzo(a)pyrene	ND	10	mg/kg
Benzo(b)fluoranthene	ND	10	mg/kg
Benzo(k)fluoranthene	ND	10	mg/kg
bis(2-Ethylhexyl)phthalate	ND	50	mg/kg
Butylbenzylphthalate	ND	10	mg/kg
Chrysene	ND	10	mg/kg
Di-n-Butylphthalate	ND	50	mg/kg
Di-n-Octylphthalate	ND	50	mg/kg
Dibenz(a,h)anthracene	ND	10	mg/kg
Dichlorobenzenes (total)	ND	30	mg/kg
Diethylphthalate	ND	10	mg/kg
Dimethylphthalate	ND	10	mg/kg
Fluoranthene	ND	10	mg/kg
Indene	ND	10	mg/kg
Naphthalene	ND	10	mg/kg
Phenanthrene	ND	10	mg/kg
Phenol	ND	10	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964599	0396G01038	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/25/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	10	mg/kg
Pyridine	ND	20	mg/kg
Quinoline	ND	10	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	63	19 - 122
2-Fluorobiphenyl	69	30 - 115
2-Fluorophenol	60	25 - 121
Nitrobenzene-d5	91	23 - 120
Phenol-d6	70	24 - 113
Terphenyl-d14	56	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0104A4
Project ID: SWMU #1
Lab ID: B964599 0396G01038
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	0.36	0.25	mg/kg
Barium, Total	06/29/96	300	10	mg/kg
Beryllium, Total	06/29/96	0.68	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	14	1.0	mg/kg
Cobalt, Total	06/29/96	4.9	1.0	mg/kg
Copper, Total	06/29/96	6.6	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	9.6	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	28	1.0	mg/kg
Zinc, Total	06/29/96	27	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

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Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0104A9
Project ID: SWMU #1
Lab ID: B964600 0396G01039
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A9		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964600	0396G01039	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	96	80 - 120
Bromofluorobenzene	100	74 - 121
Toluene-d8	102	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964600	0396G01039	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0104A9		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964600	0396G01039	Date Extracted:	06/26/96
Matrix:	Soil		Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	48	19 - 122
2-Fluorobiphenyl	49	30 - 115
2-Fluorophenol	43	25 - 121
Nitrobenzene-d5	51	23 - 120
Phenol-d6	46	24 - 113
Terphenyl-d14	45	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed LG

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TOTAL METALS ANALYSIS

Client: GIANT REFINING COMPANY
Sample ID: RFI0104A9
Project ID: SWMU #1
Lab ID: B964600 0396G01039
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	0.36	0.25	mg/kg
Barium, Total	06/29/96	170	10	mg/kg
Beryllium, Total	06/29/96	0.77	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	8.1	1.0	mg/kg
Cobalt, Total	06/29/96	4.4	1.0	mg/kg
Copper, Total	06/29/96	4.7	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	8.9	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	19	1.0	mg/kg
Zinc, Total	06/29/96	20	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0104A11
Project ID: SWMU #1
Lab ID: B964601 0396G01040
Matrix: Soil

Date Reported: 07/08/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/28/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/08/96
Sample ID:	RFI0104A11		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964601	0396G01040	Date Extracted:	06/27/96
Matrix:	Soil		Date Analyzed:	06/28/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	106	80 - 120
Bromofluorobenzene	98	74 - 121
Toluene-d8	101	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964601	0396G01040	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964601	0396G01040	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	60	19 - 122
2-Fluorobiphenyl	65	30 - 115
2-Fluorophenol	63	25 - 121
Nitrobenzene-d5	69	23 - 120
Phenol-d6	63	24 - 113
Terphenyl-d14	53	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0104A11
Project ID: SWMU #1
Lab ID: B964601 0396G01040
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	0.96	0.25	mg/kg
Barium, Total	06/29/96	420	10	mg/kg
Beryllium, Total	06/29/96	0.95	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	10	1.0	mg/kg
Cobalt, Total	06/29/96	5.9	1.0	mg/kg
Copper, Total	06/29/96	4.7	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	12	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	20	1.0	mg/kg
Zinc, Total	06/29/96	25	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0104A14
Project ID: SWMU #1
Lab ID: B964602 0396G01041
Matrix: Soil

Date Reported: 07/08/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A14		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964602	0396G01041	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	97	80 - 120
Bromofluorobenzene	88	74 - 121
Toluene-d8	98	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964602	0396G01041	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0104A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964602	0396G01041	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	57	19 - 122
2-Fluorobiphenyl	61	30 - 115
2-Fluorophenol	60	25 - 121
Nitrobenzene-d5	64	23 - 120
Phenol-d6	59	24 - 113
Terphenyl-d14	50	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0104A14
Project ID: SWMU #1
Lab ID: B964602 0396G01041
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.3	0.25	mg/kg
Barium, Total	06/29/96	180	10	mg/kg
Beryllium, Total	06/29/96	1.1	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	8.7	1.0	mg/kg
Cobalt, Total	06/29/96	5.7	1.0	mg/kg
Copper, Total	06/29/96	5.6	2.0	mg/kg
Lead, Total	06/29/96	11	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	12	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	20	1.0	mg/kg
Zinc, Total	06/29/96	19	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0105A4
Project ID: SWMU #1
Lab ID: B964603 0396G01042
Matrix: Soil

Date Reported: 07/08/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/08/96
Sample ID:	RFI0105A4		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964603	0396G01042	Date Extracted:	06/27/96
Matrix:	Soil		Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	111	80 - 120
Bromofluorobenzene	93	74 - 121
Toluene-d8	89	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed UB

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964603	0396G01042	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964603	0396G01042	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	70	19 - 122
2-Fluorobiphenyl	72	30 - 115
uorophenol	65	25 - 121
Nitrobenzene-d5	70	23 - 120
Phenol-d6	66	24 - 113
Terphenyl-d14	58	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A9		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964604	0396G01043	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0105A4
Project ID: SWMU #1
Lab ID: B964603 0396G01042
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.7	0.25	mg/kg
Barium, Total	06/29/96	330	10	mg/kg
Beryllium, Total	06/29/96	0.69	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	13	1.0	mg/kg
Cobalt, Total	06/29/96	4.7	1.0	mg/kg
Copper, Total	06/29/96	5.0	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	8.9	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	23	1.0	mg/kg
Zinc, Total	06/29/96	23	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A9		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964604	0396G01043	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	102	80 - 120
Bromofluorobenzene	97	74 - 121
Toluene-d8	90	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed US

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964604	0396G01043	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0105A9		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964604	0396G01043	Date Extracted:	06/26/96
Matrix:	Soil		Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	59	19 - 122
2-Fluorobiphenyl	73	30 - 115
2-Fluorophenol	70	25 - 121
Nitrobenzene-d5	74	23 - 120
Phenol-d6	69	24 - 113
Terphenyl-d14	59	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed US

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0105A9
Project ID: SWMU #1
Lab ID: B964604 0396G01043
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.8	0.25	mg/kg
Barium, Total	06/29/96	240	10	mg/kg
Beryllium, Total	06/29/96	1.1	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	7.1	1.0	mg/kg
Cobalt, Total	06/29/96	4.6	1.0	mg/kg
Copper, Total	06/29/96	5.3	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	8.3	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	18	1.0	mg/kg
Zinc, Total	06/29/96	15	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0105A11
Project ID: SWMU #1
Lab ID: B964605 0396G01044
Matrix: Soil

Date Reported: 07/08/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/08/96
Sample ID:	RFI0105A11		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964605	0396G01044	Date Extracted:	06/27/96
Matrix:	Soil		Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	104	80 - 120
Bromofluorobenzene	100	74 - 121
Toluene-d8	100	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964605	0396G01044	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
3enzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964605	0396G01044	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	62	19 - 122
2-Fluorobiphenyl	68	30 - 115
2-Fluorophenol	62	25 - 121
Nitrobenzene-d5	68	23 - 120
Phenol-d6	67	24 - 113
Terphenyl-d14	56	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0105A11
Project ID: SWMU #1
Lab ID: B964605 0396G01044
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.9	0.25	mg/kg
Barium, Total	06/29/96	140	10	mg/kg
Beryllium, Total	06/29/96	1.2	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	9.8	1.0	mg/kg
Cobalt, Total	06/29/96	6.1	1.0	mg/kg
Copper, Total	06/29/96	8.9	2.0	mg/kg
Lead, Total	06/29/96	11	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	11	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	22	1.0	mg/kg
Zinc, Total	06/29/96	21	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0105A14
Project ID: SWMU #1
Lab ID: B964606 0396G01045
Matrix: Soil

Date Reported: 07/08/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A14		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964606	0396G01045	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	104	80 - 120
Bromofluorobenzene	98	74 - 121
Toluene-d8	94	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964606	0396G01045	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964606	0396G01045	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	60	19 - 122
2-Fluorobiphenyl	63	30 - 115
2-Fluorophenol	58	25 - 121
Nitrobenzene-d5	65	23 - 120
Phenol-d6	64	24 - 113
Terphenyl-d14	50	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed LS

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A20		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964607	0396G01046	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A20		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964607	0396G01046	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%		QC Limits
1,2-Dichloroethane-d4	91		80 - 120
Bromofluorobenzene	86		74 - 121
Toluene-d8	123	#	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)
- Surrogate Recovery not within control limits.

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A20		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964607	0396G01046	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0105A20		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964607	0396G01046	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	64	19 - 122
2-Fluorobiphenyl	72	30 - 115
2-Fluorophenol	66	25 - 121
Nitrobenzene-d5	72	23 - 120
Phenol-d6	72	24 - 113
Terphenyl-d14	56	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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TOTAL METALS ANALYSIS

Client: GIANT REFINING COMPANY
Sample ID: RFI0105A20
Project ID: SWMU #1
Lab ID: B964607 0396G01046
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.9	0.25	mg/kg
Barium, Total	06/29/96	280	10	mg/kg
Beryllium, Total	06/29/96	0.75	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	7.7	1.0	mg/kg
Cobalt, Total	06/29/96	4.5	1.0	mg/kg
Copper, Total	06/29/96	ND	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	11	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	7.6	1.0	mg/kg
Zinc, Total	06/29/96	14	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A4		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964608	0396G01047	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A4		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964608	0396G01047	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	96	80 - 120
Bromofluorobenzene	99	74 - 121
Toluene-d8	113	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

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1160 Research Drive
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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964608	0396G01047	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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1160 Research Drive
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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A4		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964608	0396G01047	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	49	19 - 122
2-Fluorobiphenyl	52	30 - 115
2-Fluorophenol	49	25 - 121
Nitrobenzene-d5	54	23 - 120
Phenol-d6	52	24 - 113
Terphenyl-d14	54	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WS

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A9		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964609	0396G01048	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A9		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964609	0396G01048	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	06/30/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	101	80 - 120
Bromofluorobenzene	93	74 - 121
Toluene-d8	106	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed UB

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A9		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964609	0396G01048	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0106A9		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964609	0396G01048	Date Extracted:	06/26/96
Matrix:	Soil		Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	56	19 - 122
2-Fluorobiphenyl	63	30 - 115
2-Fluorophenol	59	25 - 121
Nitrobenzene-d5	62	23 - 120
Phenol-d6	60	24 - 113
Terphenyl-d14	53	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WB

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TOTAL METALS ANALYSIS

Client: GIANT REFINING COMPANY
Sample ID: RFI0106A9
Project ID: SWMU #1
Lab ID: B964609 0396G01048
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.6	0.25	mg/kg
Barium, Total	06/29/96	380	10	mg/kg
Beryllium, Total	06/29/96	0.78	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	7.9	1.0	mg/kg
Cobalt, Total	06/29/96	4.6	1.0	mg/kg
Copper, Total	06/29/96	4.7	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.7	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	19	1.0	mg/kg
Zinc, Total	06/29/96	16	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A11		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964610	0396G01049	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	07/01/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A11		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964610	0396G01049	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	07/01/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	109	80 - 120
Bromofluorobenzene	93	74 - 121
Toluene-d8	97	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed UB

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A11		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964610	0396G01049	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0106A11		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964610	0396G01049	Date Extracted:	06/26/96
Matrix:	Soil		Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	55	19 - 122
2-Fluorobiphenyl	59	30 - 115
2-Fluorophenol	53	25 - 121
Nitrobenzene-d5	57	23 - 120
Phenol-d6	60	24 - 113
Terphenyl-d14	48	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed LS

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TOTAL METALS ANALYSIS

Client: GIANT REFINING COMPANY
Sample ID: RFI0106A11
Project ID: SWMU #1
Lab ID: B964610 0396G01049
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	1.7	0.25	mg/kg
Barium, Total	06/29/96	400	10	mg/kg
Beryllium, Total	06/29/96	0.64	0.2	mg/kg
Cadmium, Total	06/29/96	0.7	0.5	mg/kg
Chromium, Total	06/29/96	6.5	1.0	mg/kg
Cobalt, Total	06/29/96	3.5	1.0	mg/kg
Copper, Total	06/29/96	4.3	2.0	mg/kg
Lead, Total	06/29/96	10	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.1	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	18	1.0	mg/kg
Zinc, Total	06/29/96	15	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ Reviewed _____

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY		Date Reported:	07/08/96
Sample ID:	RFI0106A14		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964611	0396G01050	Date Extracted:	06/27/96
Matrix:	Soil		Date Analyzed:	07/01/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A14		Date Reported:	07/08/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964611	0396G01050	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	07/01/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	105	80 - 120
Bromofluorobenzene	92	74 - 121
Toluene-d8	101	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A14		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964611	0396G01050	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0106A14		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964611	0396G01050	Date Extracted:	06/26/96
Matrix:	Soil		Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	51	19 - 122
2-Fluorobiphenyl	57	30 - 115
2-Fluorophenol	56	25 - 121
Nitrobenzene-d5	58	23 - 120
Phenol-d6	55	24 - 113
Terphenyl-d14	51	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed LJS

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client: GIANT REFINING COMPANY
Sample ID: RFI0106A20
Project ID: SWMU #1
Lab ID: B964612 0396G01051
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96
Date Extracted: 06/27/96
Date Analyzed: 07/01/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
2-Butanone (MEK)	ND	2.5	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
4-Methyl-2-pentanone (MIBK)	ND	2.5	mg/kg
Acetone	ND	2.5	mg/kg
Acrolein	ND	15	mg/kg
Acrylonitrile	ND	2.5	mg/kg
Benzene	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	2.5	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg

Continued

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1160 Research Drive
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EPA METHOD 8260
VOLATILE ORGANIC COMPOUNDS

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A20		Date Reported:	07/10/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964612	0396G01051	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/27/96
			Date Analyzed:	07/01/96

Parameter	Result	PQL	Units
Continued			
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl methacrylate	ND	2.5	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Iodomethane	ND	2.5	mg/kg
Methylene chloride	ND	2.5	mg/kg
Styrene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	2.5	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	101	80 - 120
Bromofluorobenzene	88	74 - 121
Toluene-d8	103	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Reference: Method 8260, Gas Chromatography/Mass Spectrometry for Volatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, Rev. 1, November 1992.

Analyst _____ Reviewed UB

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY		Date Reported:	07/07/96
Sample ID:	RFI0106A20		Date Sampled:	06/13/96
Project ID:	SWMU #1		Date Received:	06/19/96
Lab ID:	B964612	0396G01051	Date Extracted:	06/26/96
Matrix:	Soil		Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
Naphthalene	ND	1.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg

Continued

Inter-Mountain Laboratories, Inc.

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EPA METHOD 8270
HSL SEMI-VOLATILE COMPOUNDS
BASE/NEUTRAL/ACID EXTRACTABLES

Client:	GIANT REFINING COMPANY			
Sample ID:	RFI0106A20		Date Reported:	07/07/96
Project ID:	SWMU #1		Date Sampled:	06/13/96
Lab ID:	B964612	0396G01051	Date Received:	06/19/96
Matrix:	Soil		Date Extracted:	06/26/96
			Date Analyzed:	07/03/96

Parameter	Result	PQL	Units
Continued			
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	52	19 - 122
2-Fluorobiphenyl	58	30 - 115
2-Fluorophenol	56	25 - 121
Nitrobenzene-d5	56	23 - 120
Phenol-d6	59	24 - 113
Terphenyl-d14	46	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Reference: Method 8270, Gas Chromatography/Mass Spectrometry for Semivolatile Organics, Test Methods for Evaluating Solid Wastes, SW-846, United States Environmental Protection Agency, November 1990.

Analyst RRD

Reviewed WB

Inter-Mountain Laboratories, Inc.

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TOTAL METALS ANALYSIS

Client: **GIANT REFINING COMPANY**
Sample ID: RFI0106A20
Project ID: SWMU #1
Lab ID: B964612 0396G01051
Matrix: Soil

Date Reported: 07/10/96
Date Sampled: 06/13/96
Date Received: 06/19/96

Parameter	Date Analyzed	Result	PQL	Units
Antimony, Total	06/29/96	ND	6.0	mg/kg
Arsenic, Total	06/29/96	ND	0.25	mg/kg
Barium, Total	06/29/96	650	10	mg/kg
Beryllium, Total	06/29/96	0.56	0.2	mg/kg
Cadmium, Total	06/29/96	ND	0.5	mg/kg
Chromium, Total	06/29/96	5.4	1.0	mg/kg
Cobalt, Total	06/29/96	3.9	1.0	mg/kg
Copper, Total	06/29/96	3.2	2.0	mg/kg
Lead, Total	06/29/96	ND	10	mg/kg
Mercury, Total	06/29/96	ND	0.2	mg/kg
Nickel, Total	06/29/96	7.8	4.0	mg/kg
Selenium, Total	06/29/96	ND	0.25	mg/kg
Vanadium, Total	06/29/96	19	1.0	mg/kg
Zinc, Total	06/29/96	16	2.0	mg/kg

ND - Not Detected at Practical Quantitation Level (PQL)
Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy
Analysis: Method 7471: Mercury in Solid or Semisolid Waste (Manual Cold-Vapor)

Reference: U.S.E.P.A. 600/R-94/111, "Methods for Determination of Metals in Environmental Samples",1994.
SW-846, United States Environmental Protection Agency, November, 1992.

Analyst _____ **Reviewed** _____

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Bozeman, Montana 59715

QUALITY ASSURANCE / QUALITY CONTROL

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/26/96**
Lab ID: MBW60178
Matrix: Water

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloropropene	ND	5.0	ug/L
1,2,3-Trichlorobenzene	ND	5.0	ug/L
1,2,3-Trichloropropane	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
1,2,4-Trimethylbenzene	ND	5.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	ug/L
1,2-Dibromoethane (EDB)	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
1,3,5-Trimethylbenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichloropropane	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
2,2-Dichloropropane	ND	5.0	ug/L
2-Chlorotoluene	ND	5.0	ug/L
4-Chlorotoluene	ND	5.0	ug/L
4-Isopropyltoluene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Bromochloromethane	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Carbon Tetrachloride	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: 06/26/96
Lab ID: MBW60178
Matrix: Water

Parameter	Result	PQL	Units
Continued			
Chloroform	ND	5.0	ug/L
Chloromethane	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
Isopropylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
n-Butylbenzene	ND	5.0	ug/L
n-Propylbenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L
sec-Butylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
tert-Butylbenzene	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
Vinyl Chloride	ND	5.0	ug/L

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	104	80 - 120
Bromofluorobenzene	102	86 - 115
Toluene-d8	100	88 - 110

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/26/96**
Lab ID: MBW60178
Matrix: Water

Parameter	Result	PQL	Units

Continued

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst RRD

Reviewed WS

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Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: 06/30/96
Lab ID: MBW60182
Matrix: Water

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloropropene	ND	5.0	ug/L
1,2,3-Trichlorobenzene	ND	5.0	ug/L
1,2,3-Trichloropropane	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
1,2,4-Trimethylbenzene	ND	5.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	ug/L
1,2-Dibromoethane (EDB)	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
1,3,5-Trimethylbenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichloropropane	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
2,2-Dichloropropane	ND	5.0	ug/L
2-Chlorotoluene	ND	5.0	ug/L
4-Chlorotoluene	ND	5.0	ug/L
4-Isopropyltoluene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Bromochloromethane	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Carbon Tetrachloride	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/30/96**
Lab ID: MBW60182
Matrix: Water

Parameter	Result	PQL	Units
Continued			
Chloroform	ND	5.0	ug/L
Chloromethane	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
Isopropylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
n-Butylbenzene	ND	5.0	ug/L
n-Propylbenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L
sec-Butylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
tert-Butylbenzene	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
Vinyl Chloride	ND	5.0	ug/L

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	103	80 - 120
Bromofluorobenzene	102	86 - 115
Toluene-d8	91	88 - 110

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/30/96**
Lab ID: MBW60182
Matrix: Water

Parameter	Result	PQL	Units

Continued

Analyst _____

Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/28/96**
Lab ID: MBW60180
Matrix: Water

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	5.0	ug/L
1,1,1-Trichloroethane	ND	5.0	ug/L
1,1,2,2-Tetrachloroethane	ND	5.0	ug/L
1,1,2-Trichloroethane	ND	5.0	ug/L
1,1-Dichloroethane	ND	5.0	ug/L
1,1-Dichloroethene	ND	5.0	ug/L
1,1-Dichloropropene	ND	5.0	ug/L
1,2,3-Trichlorobenzene	ND	5.0	ug/L
1,2,3-Trichloropropane	ND	5.0	ug/L
1,2,4-Trichlorobenzene	ND	5.0	ug/L
1,2,4-Trimethylbenzene	ND	5.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	ug/L
1,2-Dibromoethane (EDB)	ND	5.0	ug/L
1,2-Dichlorobenzene	ND	5.0	ug/L
1,2-Dichloroethane	ND	5.0	ug/L
1,2-Dichloropropane	ND	5.0	ug/L
1,3,5-Trimethylbenzene	ND	5.0	ug/L
1,3-Dichlorobenzene	ND	5.0	ug/L
1,3-Dichloropropane	ND	5.0	ug/L
1,4-Dichlorobenzene	ND	5.0	ug/L
2,2-Dichloropropane	ND	5.0	ug/L
2-Chlorotoluene	ND	5.0	ug/L
4-Chlorotoluene	ND	5.0	ug/L
4-Isopropyltoluene	ND	5.0	ug/L
Benzene	ND	5.0	ug/L
Bromobenzene	ND	5.0	ug/L
Bromochloromethane	ND	5.0	ug/L
Bromodichloromethane	ND	5.0	ug/L
Bromoform	ND	5.0	ug/L
Bromomethane	ND	5.0	ug/L
Carbon Tetrachloride	ND	5.0	ug/L
Chlorobenzene	ND	5.0	ug/L
Chloroethane	ND	5.0	ug/L

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/28/96**
Lab ID: MBW60180
Matrix: Water

Parameter	Result	PQL	Units
Continued			
Chloroform	ND	5.0	ug/L
Chloromethane	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	5.0	ug/L
Dibromochloromethane	ND	5.0	ug/L
Dibromomethane	ND	5.0	ug/L
Dichlorodifluoromethane	ND	5.0	ug/L
Ethylbenzene	ND	5.0	ug/L
Hexachlorobutadiene	ND	5.0	ug/L
Isopropylbenzene	ND	5.0	ug/L
m,p-Xylene	ND	5.0	ug/L
Methylene chloride	ND	5.0	ug/L
n-Butylbenzene	ND	5.0	ug/L
n-Propylbenzene	ND	5.0	ug/L
Naphthalene	ND	5.0	ug/L
o-Xylene	ND	5.0	ug/L
sec-Butylbenzene	ND	5.0	ug/L
Styrene	ND	5.0	ug/L
tert-Butylbenzene	ND	5.0	ug/L
Tetrachloroethene (PCE)	ND	5.0	ug/L
Toluene	ND	5.0	ug/L
trans-1,2-Dichloroethene	ND	5.0	ug/L
Trichloroethene (TCE)	ND	5.0	ug/L
Trichlorofluoromethane	ND	5.0	ug/L
Vinyl Chloride	ND	5.0	ug/L

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	107	80 - 120
Bromofluorobenzene	89	86 - 115
Toluene-d8	86 #	88 - 110

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/28/96**
Lab ID: MBW60180
Matrix: Water

Parameter	Result	PQL	Units

Continued

ND - Not Detected at Practical Quantitation Level (PQL)
- Surrogate Recovery not within control limits.

Analyst _____

Reviewed _____

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/26/96**
Lab ID: MBS60177
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.0	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,1-Dichloropropene	ND	0.5	mg/kg
1,2,3-Trichlorobenzene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2,4-Trichlorobenzene	ND	0.5	mg/kg
1,2,4-Trimethylbenzene	ND	0.5	mg/kg
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.5	mg/kg
1,2-Dibromoethane (EDB)	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,3,5-Trimethylbenzene	ND	0.5	mg/kg
1,3-Dichlorobenzene	ND	0.5	mg/kg
1,3-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
1,4-Dioxane	ND	50	mg/kg
2,2-Dichloropropane	ND	0.5	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Chloro-1,3-butadiene (Chloroprene)	ND	0.75	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Chlorotoluene	ND	0.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
3-Chloroprene (Allyl Chloride)	ND	5.0	mg/kg
4-Chlorotoluene	ND	0.5	mg/kg
4-Isopropyltoluene	ND	0.5	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/28/96**
Lab ID: MBS60177
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Result	PQL	Units
Continued			
Methylene chloride	ND	2.5	mg/kg
n-Butanol	ND	5.0	mg/kg
n-Butylbenzene	ND	0.5	mg/kg
n-Propylbenzene	ND	0.5	mg/kg
Naphthalene	ND	0.5	mg/kg
o-Xylene	ND	0.5	mg/kg
Propionitrile	ND	25	mg/kg
sec-Butylbenzene	ND	0.5	mg/kg
Styrene	ND	0.5	mg/kg
tert-Butylbenzene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	5.0	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	87	80 - 120
Bromofluorobenzene	106	74 - 121
Toluene-d8	108	81 - 117

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst _____ Reviewed _____

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/28/96**
Lab ID: MBS60179
Matrix: Soil
Date Extracted: 06/27/96

Parameter	Result	PQL	Units
1,1,1,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,1-Trichloroethane	ND	0.5	mg/kg
1,1,2,2-Tetrachloroethane	ND	0.5	mg/kg
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.0	mg/kg
1,1,2-Trichloroethane	ND	0.5	mg/kg
1,1-Dichloroethane	ND	0.5	mg/kg
1,1-Dichloroethene	ND	0.5	mg/kg
1,1-Dichloropropene	ND	0.5	mg/kg
1,2,3-Trichlorobenzene	ND	0.5	mg/kg
1,2,3-Trichloropropane	ND	0.5	mg/kg
1,2,4-Trichlorobenzene	ND	0.5	mg/kg
1,2,4-Trimethylbenzene	ND	0.5	mg/kg
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.5	mg/kg
1,2-Dibromoethane (EDB)	ND	0.5	mg/kg
1,2-Dichlorobenzene	ND	0.5	mg/kg
1,2-Dichloroethane	ND	0.5	mg/kg
1,2-Dichloropropane	ND	0.5	mg/kg
1,3,5-Trimethylbenzene	ND	0.5	mg/kg
1,3-Dichlorobenzene	ND	0.5	mg/kg
1,3-Dichloropropane	ND	0.5	mg/kg
1,4-Dichlorobenzene	ND	0.5	mg/kg
1,4-Dioxane	ND	50	mg/kg
2,2-Dichloropropane	ND	0.5	mg/kg
2-Butanone (MEK)	ND	5.0	mg/kg
2-Chloro-1,3-butadiene (Chloroprene)	ND	0.75	mg/kg
2-Chloroethylvinyl ether	ND	2.5	mg/kg
2-Chlorotoluene	ND	0.5	mg/kg
2-Hexanone	ND	2.5	mg/kg
3-Chloroprene (Allyl Chloride)	ND	5.0	mg/kg
4-Chlorotoluene	ND	0.5	mg/kg
4-Isopropyltoluene	ND	0.5	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8260
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Date Analyzed: **06/28/96**
Lab ID: MBS60179
Matrix: Soil
Date Extracted: 06/27/96

Parameter	Result	PQL	Units
Continued			
4-Methyl-2-pentanone (MIBK)	ND	5.0	mg/kg
Acetone	ND	5.0	mg/kg
Acetonitrile (Methylcyanide)	ND	25	mg/kg
Acrolein	ND	7.5	mg/kg
Acrylonitrile	ND	5.0	mg/kg
Benzene	ND	0.5	mg/kg
Bromobenzene	ND	0.5	mg/kg
Bromochloromethane	ND	0.5	mg/kg
Bromodichloromethane	ND	0.5	mg/kg
Bromoform	ND	0.5	mg/kg
Bromomethane	ND	0.5	mg/kg
Carbon Disulfide	ND	5.0	mg/kg
Carbon Tetrachloride	ND	0.5	mg/kg
Chlorobenzene	ND	0.5	mg/kg
Chloroethane	ND	0.5	mg/kg
Chloroform	ND	0.5	mg/kg
Chloromethane	ND	0.5	mg/kg
cis-1,2-Dichloroethene	ND	0.5	mg/kg
cis-1,3-Dichloropropene	ND	0.5	mg/kg
Cyclohexanone	ND	37.5	mg/kg
Dibromochloromethane	ND	0.5	mg/kg
Dibromomethane	ND	0.5	mg/kg
Dichlorodifluoromethane	ND	0.5	mg/kg
Ethyl acetate	ND	5.0	mg/kg
Ethyl ether	ND	5.0	mg/kg
Ethyl methacrylate	ND	5.0	mg/kg
Ethylbenzene	ND	0.5	mg/kg
Hexachlorobutadiene	ND	0.5	mg/kg
Iodomethane	ND	5.0	mg/kg
Isobutanol	ND	50	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8260
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Date Analyzed: **06/28/96**
Lab ID: MBS60179
Matrix: Soil
Date Extracted: 06/27/96

Parameter	Result	PQL	Units
Continued			
Isopropylbenzene	ND	0.5	mg/kg
m,p-Xylene	ND	0.5	mg/kg
Methacrylonitrile	ND	25	mg/kg
Methyl methacrylate	ND	5.0	mg/kg
Methylene chloride	ND	2.5	mg/kg
n-Butanol	ND	5.0	mg/kg
n-Butylbenzene	ND	0.5	mg/kg
n-Propylbenzene	ND	0.5	mg/kg
Naphthalene	ND	0.5	mg/kg
o-Xylene	ND	0.5	mg/kg
Propionitrile	ND	25	mg/kg
sec-Butylbenzene	ND	0.5	mg/kg
Styrene	ND	0.5	mg/kg
tert-Butylbenzene	ND	0.5	mg/kg
Tetrachloroethene (PCE)	ND	0.5	mg/kg
Toluene	ND	0.5	mg/kg
trans-1,2-Dichloroethene	ND	0.5	mg/kg
trans-1,3-Dichloropropene	ND	5.0	mg/kg
trans-1,4-Dichlorobutene	ND	2.5	mg/kg
Trichloroethene (TCE)	ND	0.5	mg/kg
Trichlorofluoromethane	ND	0.5	mg/kg
Vinyl Acetate	ND	0.5	mg/kg
Vinyl Chloride	ND	0.5	mg/kg
Xylenes (total)	ND	0.5	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	110	80 - 120
Bromofluorobenzene	88	74 - 121
Toluene-d8	104	81 - 117

Continued

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LAB QA/QC
EPA METHOD 8260
METHOD BLANK

Date Analyzed: **06/28/96**
Lab ID: MBS60179
Matrix: Soil
Date Extracted: 06/27/96

Parameter	Result	PQL	Units

Continued

ND - Not Detected at Practical Quantitation Level (PQL)

Analyst _____

Reviewed _____

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LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: **06/27/96**
Lab ID: MBS96174
Matrix: Soil
Date Extracted: 06/25/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	1.0	mg/kg
1,4-Dichlorobenzene	ND	1.0	mg/kg
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2,4-Dinitrotoluene	ND	1.0	mg/kg
2-Chlorophenol	ND	1.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Chloro-3-methylphenol	ND	2.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
N-Nitrosodi-n-propylamine	ND	1.0	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: **06/27/96**
Lab ID: MBS96174
Matrix: Soil
Date Extracted: 06/25/96

Parameter	Result	PQL	Units
Continued			
Naphthalene	ND	1.0	mg/kg
Pentachlorophenol	ND	5.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	58	19 - 122
2-Fluorobiphenyl	59	30 - 115
2-Fluorophenol	56	25 - 121
Nitrobenzene-d5	60	23 - 120
Phenol-d6	58	24 - 113
Terphenyl-d14	62	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Analyst RRD

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LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: **07/02/96**
Lab ID: MBS96178A
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Result	PQL	Units
1,2,4-Trichlorobenzene	ND	1.0	mg/kg
1,4-Dichlorobenzene	ND	1.0	mg/kg
1-Methylnaphthalene	ND	1.0	mg/kg
2,4-Dimethylphenol	ND	1.0	mg/kg
2,4-Dinitrophenol	ND	2.0	mg/kg
2,4-Dinitrotoluene	ND	1.0	mg/kg
2-Chlorophenol	ND	1.0	mg/kg
2-Methylphenol	ND	1.0	mg/kg
3-Methylphenol/4-Methylphenol	ND	1.0	mg/kg
4-Chloro-3-methylphenol	ND	2.0	mg/kg
4-Nitrophenol	ND	2.0	mg/kg
6-Methyl chrysene	ND	2.0	mg/kg
7,12-Dimethylbenz(a)anthracene	ND	2.0	mg/kg
Acenaphthene	ND	1.0	mg/kg
Anthracene	ND	1.0	mg/kg
Benzenethiol (Thiophenol)	ND	1.0	mg/kg
Benzo(a)anthracene	ND	1.0	mg/kg
Benzo(a)pyrene	ND	1.0	mg/kg
Benzo(b)fluoranthene	ND	1.0	mg/kg
Benzo(k)fluoranthene	ND	1.0	mg/kg
bis(2-Ethylhexyl)phthalate	ND	5.0	mg/kg
Butylbenzylphthalate	ND	1.0	mg/kg
Chrysene	ND	1.0	mg/kg
Di-n-Butylphthalate	ND	5.0	mg/kg
Di-n-Octylphthalate	ND	5.0	mg/kg
Dibenz(a,h)anthracene	ND	1.0	mg/kg
Dichlorobenzenes (total)	ND	3.0	mg/kg
Diethylphthalate	ND	1.0	mg/kg
Dimethylphthalate	ND	1.0	mg/kg
Fluoranthene	ND	1.0	mg/kg
Indene	ND	1.0	mg/kg
N-Nitrosodi-n-propylamine	ND	1.0	mg/kg

Continued

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LAB QA/QC
EPA METHOD 8270
METHOD BLANK

Date Analyzed: **07/02/96**
Lab ID: MBS96178A
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Result	PQL	Units
Continued			
Naphthalene	ND	1.0	mg/kg
Pentachlorophenol	ND	5.0	mg/kg
Phenanthrene	ND	1.0	mg/kg
Phenol	ND	1.0	mg/kg
Pyrene	ND	1.0	mg/kg
Pyridine	ND	2.0	mg/kg
Quinoline	ND	1.0	mg/kg

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	70	19 - 122
2-Fluorobiphenyl	67	30 - 115
2-Fluorophenol	65	25 - 121
Nitrobenzene-d5	75	23 - 120
Phenol-d6	68	24 - 113
Terphenyl-d14	44	18 - 137

ND - Not Detected at Practical Quantitation Level (PQL)
6-Methylchrysene, Benzenethiol, and Quinoline were not analyzed as part of the calibration.

Analyst RRD

Reviewed US

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LAB QA/QC
EPA METHOD 8260
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: **06/28/96**
Lab ID: 0596H04594
Matrix: Soil
Date Extracted: 06/26/96

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
1,1-Dichloroethene	2.0	0	1.5	75	75 - 145
Benzene	2.0	0	1.7	85	71 - 120
Chlorobenzene	2.0	0	1.9	95	76 - 127
Toluene	2.0	0	1.9	95	71 - 127
Trichloroethene (TCE)	2.0	0	1.7	85	75 - 130

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	MSD Result (mg/kg)	MSD Recovery %	RPD %	QC Limits RPD	QC Limits Rec.
1,1-Dichloroethene	2.0	1.8	90	18	22	75 - 145
Benzene	2.0	1.9	95	11	24	71 - 120
Chlorobenzene	2.0	2.1	105	10	21	76 - 127
Toluene	2.0	2.3	115	19	21	71 - 127
Trichloroethene (TCE)	2.0	2.0	100	16	21	75 - 130

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 10 outside QC limits.
RPD: 0 out of 5 outside QC limits.

Analyst _____

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LAB QA/QC
METHOD 8260
LAB CONTROL SAMPLE

Date Analyzed: **06/30/96**
Lab ID: LCW60182
Matrix: Water

Parameter	Spike Added (mg/L)	Sample Result (mg/L)	LCS Result (mg/L)	LCS % Recovery	QC Limits Rec.
1,1,2-Trichloroethane	0.02	0	0.018	90	80 -120
1,2-Dibromoethane (EDB)	0.02	0	0.018	90	80 -120
1,2-Dichloroethane	0.02	0	0.017	85	80 -120
1,2-Dichloropropane	0.02	0	0.017	85	80 -120
1,4-Dichlorobenzene	0.02	0	0.02	100	80 -120
Benzene	0.02	0	0.018	90	80 -120
Bromoform	0.02	0	0.016	80	80 -120
Carbon Tetrachloride	0.02	0	0.017	85	80 -120
cis-1,3-Dichloropropene	0.02	0	0.017	85	80 -120
rachloroethene (PCE)	0.02	0	0.018	90	80 -120
richloroethene (TCE)	0.02	0	0.019	95	80 -120
Vinyl Chloride	0.02	0	0.02	100	80 -120

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	97	80 -120
Bromofluorobenzene	100	86 -115
Toluene-d8	91	88 -110

Spike Recovery: 0 out of 12 outside QC limits.
Surrogates: Surrogate Recoveries within QC Limits.

Analyst _____

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LAB QA/QC
A METHOD 8260
LAB CONTROL SAMPLE

Date Analyzed: **06/30/96**
Lab ID: LCW60182
Matrix: Water

Parameter	Spike Added (mg/L)	Sample Result (mg/L)	LCS Result (mg/L)	LCS % Recovery	QC Limits Rec.
1,1,2-Trichloroethane	0.02	0	0.018	90	80 -120
1,2-Dibromoethane (EDB)	0.02	0	0.018	90	80 -120
1,2-Dichloroethane	0.02	0	0.017	85	80 -120
1,2-Dichloropropane	0.02	0	0.017	85	80 -120
1,4-Dichlorobenzene	0.02	0	0.02	100	80 -120
Benzene	0.02	0	0.018	90	80 -120
Bromoform	0.02	0	0.016	80	80 -120
Carbon Tetrachloride	0.02	0	0.017	85	80 -120
cis-1,3-Dichloropropene	0.02	0	0.017	85	80 -120
rachloroethene (PCE)	0.02	0	0.018	90	80 -120
Trichloroethene (TCE)	0.02	0	0.019	95	80 -120
Vinyl Chloride	0.02	0	0.02	100	80 -120

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
1,2-Dichloroethane-d4	97	80 -120
Bromofluorobenzene	100	86 -115
Toluene-d8	91	88 -110

Spike Recovery: 0 out of 12 outside QC limits.
Surrogates: Surrogate Recoveries within QC Limits.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY

Date Analyzed: **06/27/96**
Lab ID: 0596H04586
Matrix: Soil
Date Extracted: 06/25/96

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
1,2,4-Trichlorobenzene	10	0	6.3	63	38 -107
1,4-Dichlorobenzene	10	0	5.6	56	28 -104
2,4-Dinitrotoluene	10	0	7.7	77	28 - 89
2-Chlorophenol	20	0	12	60	25 -102
4-Chloro-3-methylphenol	20	0	14	70	26 -103
4-Nitrophenol	20	0	13	65	11 -114
Acenaphthene	10	0	6.9	69	31 -137
N-Nitrosodi-n-propylamine	10	0	8.9	89	41 -126
Pentachlorophenol	20	0	16	80	17 -109
Phenol	20	0	11	55	26 - 90
Pyrene	10	0	6.6	66	35 -142

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	MSD Result (mg/kg)	MSD Recovery %	RPD %	QC Limits RPD	QC Limits Rec.
1,2,4-Trichlorobenzene	10	6.4	64	2	23	38 -107
1,4-Dichlorobenzene	10	5.7	57	2	27	28 -104
2,4-Dinitrotoluene	10	7.4	74	4	47	28 - 89
2-Chlorophenol	20	12	60	0	50	25 -102
4-Chloro-3-methylphenol	20	14	70	0	33	26 -103
4-Nitrophenol	20	12	60	8	50	11 -114
Acenaphthene	10	6.8	68	1	19	31 -137
N-Nitrosodi-n-propylamine	10	8.9	89	0	38	41 -126
Pentachlorophenol	20	15	75	6	47	17 -109
Phenol	20	10	50	10	35	26 - 90
Pyrene	10	6.7	67	2	36	35 -142

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 22 outside QC limits.
RPD: 0 out of 11 outside QC limits.

Analyst RRD

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
MATRIX SPIKE

Date Analyzed: **07/03/96**
Lab ID: 0596H04607 SK1 0396G01046
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
1,2,4-Trichlorobenzene	10	0	7.5	75	38 -107
1,4-Dichlorobenzene	10	0	6.6	66	28 -104
2,4-Dinitrotoluene	10	0	6.4	64	28 - 89
2-Chlorophenol	20	0	14	70	25 -102
4-Chloro-3-methylphenol	20	0	14	70	26 -103
4-Nitrophenol	20	0	12	60	11 -114
Acenaphthene	10	0	6.4	64	31 -137
N-Nitrosodi-n-propylamine	10	0	8.7	87	41 -126
Pentachlorophenol	20	0	13	65	17 -109
Phenol	20	0	12	60	26 - 90
Pyrene	10	0	5.7	57	35 -142

QUALITY CONTROL - Surrogate Recovery	%	QC Limits
2,4,6-Tribromophenol	65	19 -122
2-Fluorobiphenyl	68	30 -115
2-Fluorophenol	64	25 -121
Nitrobenzene-d5	72	23 -120
Phenol-d6	68	24 -113
Terphenyl-d14	51	18 -137

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 11 outside QC limits.

Analyst RRD

Reviewed WS

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
EPA METHOD 8270
BLANK SPIKE / BLANK SPIKE DUPLICATE SUMMARY

Date Analyzed: **07/02/96**
Lab ID: BSS96178
Matrix: Soil
Date Extracted: 06/26/96

Original Sample Parameters

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	BS Recovery %	QC Limits Rec.
1,2,4-Trichlorobenzene	10	0	8.1	81	38 - 107
1,4-Dichlorobenzene	10	0	7.0	70	28 - 104
2,4-Dinitrotoluene	10	0	6.8	68	28 - 89
2-Chlorophenol	20	0	13	65	25 - 102
4-Chloro-3-methylphenol	20	0	15	75	26 - 103
4-Nitrophenol	20	0	14	70	11 - 114
Acenaphthene	10	0	6.4	64	31 - 137
N-Nitrosodi-n-propylamine	10	0	9.8	98	41 - 126
Pentachlorophenol	20	0	16	80	17 - 109
Phenol	20	0	11	55	26 - 90
Pyrene	10	0	5.2	52	35 - 142

Duplicate Sample Parameters

Parameter	Spike Added (mg/kg)	BSD Result (mg/kg)	BSD Recovery %	RPD %	QC Limits RPD	QC Limits Rec.
1,2,4-Trichlorobenzene	10	8.4	84	4	23	38 - 107
1,4-Dichlorobenzene	10	7.5	75	7	27	28 - 104
2,4-Dinitrotoluene	10	6.9	69	1	47	28 - 89
2-Chlorophenol	20	13	65	0	50	25 - 102
4-Chloro-3-methylphenol	20	14	70	7	33	26 - 103
4-Nitrophenol	20	15	75	7	50	11 - 114
Acenaphthene	10	6.8	68	6	19	31 - 137
N-Nitrosodi-n-propylamine	10	10	100	2	38	41 - 126
Pentachlorophenol	20	17	85	6	47	17 - 109
Phenol	20	11	55	0	35	26 - 90
Pyrene	10	5.2	52	0	36	35 - 142

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 22 outside QC limits.
RPD: 0 out of 11 outside QC limits.

Analyst RD

Reviewed WS

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
TOTAL METALS ANALYSIS
MATRIX SPIKE

Date Analyzed: **06/29/96**
Lab ID: 0596H04589 SK1 0396G01028
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
Antimony, Total	140	0	140	100	75 -125
Arsenic, Total	1.0	1.8	2.9	110	75 -125
Barium, Total	140	470	570	71 *	75 -125
Beryllium, Total	28	0.49	24	84	75 -125
Cadmium, Total	57	0	45	79	75 -125
Chromium, Total	140	6.1	120	81	75 -125
Cobalt, Total	57	3.2	48	79	75 -125
Copper, Total	140	3.8	133	92	75 -125
Lead, Total	140	0	120	86	75 -125
Mercury, Total	0.5	0	0.51	102	75 -125
Nickel, Total	140	56	200	103	75 -125
Selenium, Total	1.0	0	1.04	104	75 -125
Vanadium, Total	57	15	65	88	75 -125
Zinc, Total	140	17	140	88	75 -125

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 1 out of 14 outside QC limits.

Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy

Analyst SK

Reviewed US

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
TOTAL METALS ANALYSIS
MATRIX SPIKE

Date Analyzed: **06/29/96**
Lab ID: 0596H04599 SK1 0396G01038
Matrix: Soil
Date Extracted: 06/26/96

Parameter	Spike Added (mg/kg)	Sample Result (mg/kg)	Spike Result (mg/kg)	MS Recovery %	QC Limits Rec.
Antimony, Total	150	0	140	93	75 -125
Arsenic, Total	1.0	0.36	1.4	104	75 -125
Barium, Total	150	300	460	107	75 -125
Beryllium, Total	30	0.68	26	84	75 -125
Cadmium, Total	59	0	48	81	75 -125
Chromium, Total	150	14	140	84	75 -125
Cobalt, Total	59	4.9	52	80	75 -125
Copper, Total	150	6.6	150	96	75 -125
Lead, Total	150	0	130	87	75 -125
Mercury, Total	0.5	0	0.46	92	75 -125
Nickel, Total	150	9.6	130	80	75 -125
Selenium, Total	0.5	0	0.56	112	75 -125
Vanadium, Total	59	28	77	83	75 -125
Zinc, Total	150	27	160	89	75 -125

Note: Spike Recoveries are calculated using zero for Sample result if Sample result was less than PQL (Practical Quantitation Level).

Spike Recovery: 0 out of 14 outside QC limits.

Preparation: Method 3050, Acid Digestion of Soils, Sediments, and Sludges.
Analysis: Method 6010: Inductively Coupled Plasma-Atomic Emission Spectroscopy
Analysis: Method 7000: Atomic Absorption Spectroscopy

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
TOTAL METALS ANALYSIS
DUPLICATE SUMMARY

Date Analyzed: **06/29/96**
Lab ID: 0596H04588
Matrix: Soil

Parameter	Sample Result (mg/kg)	Dup Result (mg/kg)	RPD %	QC Limits RPD	PQL
Antimony, Total	ND	ND	NA	35	6.0
Barium, Total	600	630	5	35	10
Beryllium, Total	0.62	0.6	NA	35	0.2
Cadmium, Total	ND	ND	NA	35	0.5
Chromium, Total	6.8	9.0	28	35	1.0
Cobalt, Total	4.0	4.1	NA	35	1.0
Copper, Total	6.1	4.5	NA	35	2.0
Lead, Total	ND	ND	NA	35	10
Nickel, Total	9.7	12	NA	35	4.0
Vanadium, Total	19	27	35	35	1.0
Zinc, Total	21	19	10	35	2.0

ND - Not Detected at Practical Quantitation Level (PQL)
NA - Not Applicable at low levels.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
TOTAL METALS ANALYSIS
DUPLICATE SUMMARY

Date Analyzed: **06/29/96**
Lab ID: 0596H04590
Matrix: Soil

Parameter	Sample Result (mg/kg)	Dup Result (mg/kg)	RPD %	QC Limits RPD	PQL
Antimony, Total	ND	ND	NA	35	6.0
Arsenic, Total	1.2	1.5	NA	35	0.25
Barium, Total	620	620	0	35	10
Beryllium, Total	0.66	0.6	NA	35	0.2
Cadmium, Total	ND	ND	NA	35	0.5
Chromium, Total	10	9.3	7	35	1.0
Cobalt, Total	6.4	5.4	17	35	1.0
Copper, Total	ND	ND	NA	35	2.0
Lead, Total	ND	ND	NA	35	10
Nickel, Total	13	34	NA	35	4.0
Selenium, Total	ND	ND	NA	35	0.25
Vanadium, Total	27	30	11	35	1.0
Zinc, Total	28	26	7	35	2.0

ND - Not Detected at Practical Quantitation Level (PQL)
NA - Not Applicable at low levels.

Analyst _____ Reviewed _____

Inter-Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
TOTAL METALS ANALYSIS
DUPLICATE SUMMARY

Date Analyzed: **06/29/96**
Lab ID: 0596H04598
Matrix: Soil

Parameter	Sample Result (mg/kg)	Dup Result (mg/kg)	RPD %	QC Limits RPD	PQL
Antimony, Total	ND	ND	NA	35	6.0
Barium, Total	460	620	30	35	10
Beryllium, Total	0.64	0.63	NA	35	0.2
Cadmium, Total	ND	ND	NA	35	0.5
Chromium, Total	9.9	12	19	35	1.0
Cobalt, Total	4.8	4.2	NA	35	1.0
Copper, Total	3.3	3.9	NA	35	2.0
Lead, Total	ND	ND	NA	35	10
Mercury, Total	ND	ND	NA	35	0.2
Nickel, Total	8.5	8.0	NA	35	4.0
Selenium, Total	ND	ND	NA	35	0.25
Vanadium, Total	23	21	9	35	1.0
Zinc, Total	20	22	10	35	2.0

ND - Not Detected at Practical Quantitation Level (PQL)
NA - Not Applicable at low levels.

Analyst _____ Reviewed _____

Inter·Mountain Laboratories, Inc.

1160 Research Drive
Bozeman, Montana 59715

LAB QA/QC
TOTAL METALS ANALYSIS
DUPLICATE SUMMARY

Date Analyzed: **06/29/96**
Lab ID: 0596H04607
Matrix: Soil

Parameter	Sample Result (mg/kg)	Dup Result (mg/kg)	RPD %	QC Limits RPD	PQL
Antimony, Total	ND	ND	NA	35	6.0
Barium, Total	280	280	0	35	10
Beryllium, Total	0.75	0.69	NA	35	0.2
Cadmium, Total	ND	ND	NA	35	0.5
Chromium, Total	7.7	6.9	11	35	1.0
Cobalt, Total	4.5	4.2	NA	35	1.0
Copper, Total	ND	ND	NA	35	2.0
Lead, Total	ND	ND	NA	35	10
Mercury, Total	ND	ND	NA	35	0.2
Nickel, Total	11	10	NA	35	4.0
Selenium, Total	ND	ND	NA	35	0.25
Vanadium, Total	7.6	7.5	1	35	1.0
Zinc, Total	14	12	15	35	2.0

ND - Not Detected at Practical Quantitation Level (PQL)
NA - Not Applicable at low levels.

Analyst _____ Reviewed _____

GIANT

REFINING COMPANY

April 5, 2001

Mr. Roger Anderson
Environmental Bureau Chief
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87504

Dear Mr. Anderson:

SUBJECT: OCD ANNUAL REPORT

Pursuant to the water discharge permit, GW-32, Giant Refining Company - Ciniza (Giant) submits the 2000 Annual OCD Report.

The data presented in the enclosed report is arranged in the following order:

I. API Effluent and Aeration Lagoon 2 Effluent Analytical Data.
II. OCD Landfarm Soil Analytical Data
III. Tabulated Analytical Data - OW-1, 2, and 3 - 1999
IV. Original Analytical Data - OW-1, 2, and 3 - 1999

In order to help identify the sample points, please note that "AL1" signifies a sample taken from the Inlet to Aeration Lagoon 1, which is the effluent from the API. The abbreviation "EP1" signifies a sample taken from the Inlet to Evaporation Pond 1, which is the effluent from Aeration Lagoon 2.

As I reported to Wayne Price by phone earlier this year, Ciniza did not sample Observation Wells OW 1, 2 and 3 in 2000. There were a variety of reasons, including pump and compressor failures, weather, plant emergencies and family illnesses. The sampling of these wells slipped through the cracks and did not get completed. We have developed a new system to ensure that all sampling events are completed and documented. We apologize and do not expect this to happen again.

We are currently sampling OW 1, 2, and 3 in addition to other wells as part of our Discharge Plan renewal. As soon as we receive the analytical results, we will forward them to you.

PHONE
505-722-3833
FAX
505-722-0210

ROUTE 3
BOX 7
GALLUP
NEW MEXICO
87301

A history of the BTEX results from site wells was included in the Comprehensive Facility Work Plan submitted to your office in April 2000.

If you have any questions or require additional information, please do not hesitate to contact me at (505) 722-0227.

Sincerely,

Dorinda Mancini, Environmental Manager
Giant Refining Company

cc: Matthew R. Davis, General Manager
David Pavlich, Environmental Superintendent
Denny Foust, OCD, Aztec Office

Env/ocd/annual2000

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **001068**
February 14, 2000

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name samples ~~fall 1999~~ 2000
Project Number OCD Permit

Attention: STEVE MORRIS

On 01/25/00 Pinnacle Laboratories, Inc. Inc., (ADHS License No. AZ0592), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All parameters were performed by Severn Trent (FL) Inc., Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: GIANT REFINING COMPANY	PINNACLE ID	: 001068
PROJECT #	: OCD Permit	DATE RECEIVED	: 01/25/00
PROJECT NAME	: samples fall 1999	REPORT DATE	: 02/14/00

PIN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	EP1-12400	AQUEOUS	01/24/00
02	AL1-12400	AQUEOUS	01/24/00

Commited To *Your* Success

LOG NO: C0-01527
Received: 25 JAN 00
Reported: 11 FEB 00

Ms. Kim McNeill
Pinnacle Laboratories
2709-D Pan American Freeway Northeast
Albuquerque, NM 87107

Project: GRC, 001068
Sampled By: Client
Code: 082300211

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
01527-1	EP1-12400	01-24-00/09:00
01527-2	AL1-12400	01-24-00/09:15

PARAMETER	01527-1	01527-2
Biochemical Oxygen Demand (5 Day) (405.1/5210B), mg/l	120	420
Analyst	BE	BE
Prep Date	01.26.00	01.26.00
Analysis Date	01.31.00	01.31.00
Batch ID	BDW006	BDW006
Chemical Oxygen Demand (410.4), mg/l	820	770
Analyst	RB	RB
Prep Date	01.26.00	01.26.00
Analysis Date	01.28.00	01.28.00
Batch ID	CHX005	CHX005
Total Organic Carbon (415.1), mg/l	110	110
Analyst	BT	BT
Prep Date	02.09.00	02.09.00
Analysis Date	02.09.00	02.09.00
Batch ID	TOW108	TOW108
Total Dissolved Solids (160.1), mg/l	7500	3200
Analyst	ED	ED
Prep Date	01.26.00	01.26.00
Analysis Date	01.27.00	01.27.00
Batch ID	TDW006	TDW006

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: 1-24-00 PAGE: 1 OF 1

AEN(NM) Accession #: C001527

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210

BILL TO: Same
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	BOD-COD-TDS-TOC	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		NUMBER OF CONTAINERS
EP1-12400	1/24/00	0900	H_2O	1											X																		
AL1-12400	1/24/00	0915	H_2O	2											X																		

PROJECT INFORMATION

~~PROJ. NO.:~~ OCD Permit
PROJ. NAME: samples fall
P.O. NO.: 1999
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	
CUSTODY SEALS	Y/N/NA
RECEIVED INTACT	
BLUE ICE/ICE	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Steve Morris Time: 1000AM	Signature: Time:
Printed Name: Steve Morris Date: 1-24-00	Printed Name: Date:
Company: Giant-Ciniza	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Linda L. Kitt Time: 0925	Signature: Time:
Printed Name: Linda L. Kitt Date: 1/25/00	Printed Name: Date:
Company: STL/FI	American Enviromental Network (NM), Inc.

GIANT
INDUSTRIES, INC.

Route 3, Box 7
Gallup, New Mexico
87301
505-722-3833
505-722-0210 FAX

April 19, 2000

Mr. Roger Anderson
Environmental Bureau Chief
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Dear Mr. Anderson:

SUBJECT: OCD ANNUAL REPORT

Pursuant to the water discharge permit, GW-32, Giant Refining Company - Ciniza (Giant) submits two copies of the 1999 Annual OCD Report.

The data presented in the enclosed report is arranged in the following order:

I. API Effluent and Aeration Lagoon 2 Effluent Analytical Data
II. OCD LTA Soil Analytical Data
III. Tabulated Analytical Data - OW-1, 2, and 3
IV. Original Analytical Data - OW-1, 2, and 3

In order to help identify the sample points, please note that "AL1" signifies a sample taken from the Inlet to the Aeration Lagoon 1, which is the API effluent from the API. The abbreviation "EP1" signifies a sample taken from the Inlet to Evaporation Pond 1, which is the effluent from Aeration Lagoon 2.

If you have any comments or require additional information, please do not hesitate to contact me at (505) 722-0227.

Sincerely,

Dorinda Mancini, Environmental Manager
Ciniza Refinery, Giant Refining Company

cc: Denny Foust, OCD, Aztec Office

cc: Cover Letter only:
Matthew R. Davis, General Manager
David Pavlich, Environmental Superintendent
Sarah Allen, Corporate Counsel

env/ocd/ocdannual99

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

PL I.D. **903069**

April 2, 1999

Giant Refining Company
Route 3, Box 71
Gallup, NM 87301

Project Name/Number: OCD PERMIT SAMPLING SPRING 1999

Attention: Steve Morris

On **03/23/99**, Pinnacle Laboratories Inc., (ADHS License No. AZ0592), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All analyses were performed by Severn Trent Laboratories, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
General Manager

MR:ft

Enclosure

RECEIVED
APR 5 1999
GIANT REFINING CO.
CINIZA REFINERY

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	:GIANT REFINING COMPANY	DATE RECEIVED	:03/23/99
PROJECT #	:(NONE)		
PROJECT NAME	:OCD PERMIT SAMPLING SPRING 1999	REPORT DATE	:04/02/99

PL ID: 903069

	PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	903069-01	EP-1-32299	AOUEOUS	3/22/99
02	903069-02	AL-1-32299	AOUEOUS	3/22/99

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

"Method Report Summary"

Accession Number: 903490
Client: PINNACLE LABORATORIES
Project Number: 903069
Project Name: GRC/OCD PERMIT SAMPLING SPRING 1999
Project Location: N/S
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
903069-01 EP-1-32299	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	910
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6000
903069-02 AL-1-32299	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	1100
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	2600

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"Method Report Summary"

Accession Number: 903490
Client: PINNACLE LABORATORIES
Project Number: 903069
Project Name: GRC/OCD PERMIT SAMPLING SPRING 1999
Project Location: N/S
Test: TOTAL ORGANIC CARBON

Client Sample Id:		Parameter:	Unit:	Result:
903069-01	EP-1-32299	TOTAL ORGANIC CARBON	MG/L	120
903069-02	AL-1-32299	TOTAL ORGANIC CARBON	MG/L	230

Amer n Environmental Network (NM), Inc.
Albuquerque • Phoenix • Pensacola • Portland • Pleasant Hills • Columbia

CH N OF CUSTODY

DATE: 3/22/99 PAGE: 1 OF 1

AEN LAB I.D. 903069

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Co./Ciniza
ADDRESS: Rt. 3 Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210

BILL TO: Same
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct/Inject	TDS, COD, + TOC	(M8015) Gas/Purge & Trap	Gasoline/BTEX & MTBE (M8015/8020)	BTXE/MTBE (8020)	BTEX & Chlorinated Aromatics (602/8020)	BTEX/MTBE/EDC & EDB (8020/8010/Short)	Chlorinated Hydrocarbons (601/8010)	504 EDB ☐ / DBCP ☐	Polynuclear Aromatics (610/8310)	Volatile Organics (624/8240) GC/MS	Volatile Organics (8260) GC/MS	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	General Chemistry:	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
EP-1-32299	3/22/99	0800	H_2O	01			X																				4
AL-1-32299	"	0830	"	02			X																				4

PROJECT INFORMATION

~~PROJ. NO.~~: OCD Permit
PROJ. NAME: sampling
~~P.O. NO.~~: spring 1999
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	8
CUSTODY SEALS	(Y) N / NA
RECEIVED INTACT	Yes
BLUE ICE/ICE	10°C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: [signature] Time: 0930	Signature: Time:
Printed Name: Steve Morris Date: 3/22/99	Printed Name: Date:
Company: Giant - Ciniza	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: [signature] Time: 1100
Printed Name: Date:	Printed Name: Francine Tonio Date: 3/23/99
Company:	American Enviromental Network (NM), Inc.

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

PL I.D. **903088**

April 1, 1998

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: SAMPLING SPRING 1999 OCD PERMIT

Attention: Steve Morris

On **03/23/99**, Pinnacle Laboratories Inc., (ADHS License No. AZ0592), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All analyses were performed by Severn Trent Laboratories, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
General Manager

MR:jt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	:GIANT REFINING CO.	DATE RECEIVED	:03/23/99
PROJECT #	:OCD PERMIT		
PROJECT NAME	:SAMPLING SPRING 1999	REPORT DATE	:04/01/99

PL ID: 903088

	PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	903088-01	EP-1-32299	AQUEOUS	03/22/99
02	903088-02	AL-1-32299	AQUEOUS	03/22/99

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

SEVERN TRENT LABORATORIES 11 East Olive Road Pensacola, Florida 32514 (850) 474-1001

"Method Report Summary"

Accession Number: 903460
Client: PINNACLE LABORATORIES
Project Number: N/S
Project Name: CCD PERMIT SAMPLING SPRING 1999
Project Location: N/S
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
EP-1-32299	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	390
AL-1-32299	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	540

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 3/22/99 PAGE: 1 OF 1

PLI Accession #: 9034 0

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Co. / Ciniza
ADDRESS: Rt. 3 Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210

BILL TO: Same
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	BOD	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐		8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry:		Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		NUMBER OF CONTAINERS
EP-1-32299	3/22/99	0800	H_2O				X																										
AL-1-32299	"	0830	"				X																										

PROJECT INFORMATION

~~PROJ. NO.~~ QCD Permit
PROJ. NAME: sampling
~~PO NO.~~ spring 1999
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	
CUSTODY SEALS	Y/N/NA
RECEIVED INTACT	
BLUE ICE/ICE	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: [signature] Time: 0930	Signature: Time:
Printed Name: Steve Morris Date: 3/22/99	Printed Name: Date:
Company: Giant - Ciniza (See reverse side (Force Majeure))	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: [signature] Time: 0825	Signature: Time:
Printed Name: Linda Kitt-Moorer Date: 3-23-99	Printed Name: Date:
Company: STL FI	Pinnacle Laboratories Inc.

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **001019**
January 17, 2000

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name SAMPLING FALL 1999
Project Number OCD Permit

Attention: STEVE MORRIS

On 12/16/99 Pinnacle Laboratories, Inc. Inc., (ADHS License No. AZ0592), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Due to laboratory error, EPA holding time was not met for TDS and BOD. We apologize for any inconvenience this may have caused. There is no charge for these samples.

All parameters were performed by Severn Trent (FL) Inc., Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

PINNACLE LABORATORIES

2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: GIANT REFINING COMPANY	PINNACLE ID	: 001019
PROJECT #	: OCD Permit	DATE RECEIVED	: 12/16/99
PROJECT NAME	: SAMPLING FALL 1999	REPORT DATE	: 01/17/00

PIN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	EP1-121499	AQUEOUS	12/14/99
02	AL1-121499	AQUEOUS	12/14/99

Committed To *Your* Success

CASE NARRATIVE

Date:	January 13, 2000
STL Accession Number:	912226
Project Name:	OCD Permit-Giant Refining
Project Location:	n/s
Methods:	TDS/BOD

STL Sample ID	*Client Sample ID*
912514-01	EP1-121499
912514-02	AL1-121499

The samples listed above were received at the laboratory on 16-DEC-99 in good condition at a temperature of 3°C.

BOD samples received out of hold time.

TDS analyzed out of hold time due to problems encountered by the lab during relocation.

No other problems were associated with the analysis of these samples.

Lance W. Larson
STL-Fl Project Manager

Committed To *Your* Success

Severn Trent Laboratories
3355 McLemore Drive
Pensacola FL 32514

Tel: (850) 474-1001
Fax: (850) 478-2671

CASE NARRATIVE

Date:	January 12, 2000
STL Accession Number:	912514
Project Name:	GRC/OCD Permit Sampling Fall 1999
Project Location:	N/S
Methods:	BOD-405.1/COD-410.4/TOC-415.1/TDS-160.1

STL Sample ID	*Client Sample ID*
912514-1	EP1-121499
912514-2	AL1-121499

The samples listed above were received at the laboratory on 16-DEC-99 in good condition at a temperature of 2°C.

The samples for TDS-160.1 were not analyzed within the hold times due to a laboratory error.

An Out of Control Event/Corrective Action form has been documented for this problem and has been filed in our QA Department.

No other problems were associated with the analysis of these samples.

Lance W. Larson
STL-Fl Project Manager

Committed To Your Success

LOG NO: C9-12514
Received: 16 DEC 99
Reported: 09 JAN 00

Ms. Kim McNeill
Pinnacle Laboratories
2709-D Pan American Freeway Northeast
Albuquerque, NM 87107

Project: 912062-GIANT REFINNING COMPANY
Sampled By: Client
Code: 09530019

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
12514-1	EP1-121499	12-14-99/09:45
12514-2	AL1-121499	12-14-99/09:30

PARAMETER	12514-1	12514-2
Biochemical Oxygen Demand (5 Day) (405.1/5210B), mg/l	130	94
Analyst	BE	BE
Prep Date	12.17.99	12.17.99
Analysis Date	12.22.99	12.22.99
Batch ID	BDW110	BDW110
Chemical Oxygen Demand (410.4), mg/l	1300	770
Analyst	RB	RB
Prep Date	12.21.99	12.21.99
Analysis Date	12.22.99	12.22.99
Batch ID	CHX048	CHX048
Total Organic Carbon (415.1), mg/l	100	82
Analyst	BT	BT
Analysis Date	12.23.99	12.23.99
Batch ID	TOW095	TOW095
Total Dissolved Solids (160.1), mg/l	7400	4100
Analyst	ED	ED
Prep Date	12.22.99	12.22.99
Analysis Date	12.27.99	12.27.99
Batch ID	TDW065	TDW065

To: Kim Mc 1061

PIN 001019

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: _____ PAGE: 1 OF 1

AEN/NM Accession #: 912514

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PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Company

ADDRESS: Route 3, Box 17
Gallup NM 87301

PHONE: 505-722-3833

FAX: 505-722-0210

BILL TO: Same

COMPANY:

ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
EP1-121499	12/14/99	0945	H_2O												BOD, COD, TOC, TDS																
AL1-121499	12/14/99	0930	"																												

red out

PROJECT INFORMATION

~~PROJ. NO.~~: OCD Permit

PROJ. NAME: sampling fall

P.O. NO.: 1999

SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS:

CUSTODY SEALS: Y / N / NA

RECEIVED INTACT:

BLUE ICE:

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECT!

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

912514

RELINQUISHED BY: 1

Signature: SC Morris Time: 0830

Printed Name: Steve Morris Date: 12/15/99

Company: Giant-Ciniza

RECEIVED BY: 1

Signature: Allen Page Time: 0900

Printed Name: Allen Page Date: 12-16-99

Company: STL-Ft 6900

RELINQUISHED BY: 2

Signature: Time:

Printed Name: Date:

Company:

RECEIVED BY (LAB): 2

Signature: Time:

Printed Name: Date:

American Environmental Network (NM), Inc.

1/5/98 AEN Inc.: American Environmental Network (NM), Inc. • 2709-D Pan American Freeway, NE • Albuquerque, Mexico 87107 • (505) 344-3777 • Fax (505) 344-4413

DISTRIBUTION: White - AEN, Ca - Originator

Jan 11 00 11:50a STL/Pensacola 850 478-2671 p.1

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	DATE RECEIVED	: 01/14/98
PROJECT #	: (NONE)		
PROJECT NAME	: OCD WASTEWATER	REPORT DATE	: 01/28/98

AEN ID: 801331

	AEN ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	801331-01	EP1-11398	AQUEOUS	01/13/98
02	801331-02	AL1-11398	AQUEOUS	01/13/98

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

AEN STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

"Method Report Summary"

Accession Number: 801284
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 801331
Project Name: GIANT REFINERY
Project Location: CINIZA
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
801331-01	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	110
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	800
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400
	TOTAL SUSPENDED SOLIDS (160.2)	MG/L	100
801331-02	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	160
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	900
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6500
	TOTAL SUSPENDED SOLIDS (160.2)	MG/L	170

AMERICAN ENVIRONMENTAL NETWORK 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

"Method Report Summary"

Accession Number: 801284
Client: AMERICAN ENVIRONMENTAL NETWORK (NEW MEXICO) INC.
Project Number: 801331
Project Name: GIANT REFINERY
Project Location: CINIZA
Test: TOTAL ORGANIC CARBON

Client Sample Id:	Parameter:	Unit:	Result:
801331-01	TOTAL ORGANIC CARBON	MG/L	82
801331-02	TOTAL ORGANIC CARBON	MG/L	100

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Giant Refining Co.
Project: Ciniza Refinery
Sample ID: Aeration Lagoon Influent
Lab ID: 0397W00618
Matrix: Water
Condition: Cool/Intact

Date Received: 04/17/97
Date Reported: 06/17/97
Date Sampled: 04/16/97
Time Sampled: 0915

Parameter	Analytical Result	Units	Units	PQL	Method	Analysis Date	Time	Init.
GENERAL PARAMETERS								
Oxygen Demand - BOD	297	mg/L		N/A	EPA 405.1	04/17/97	1230	WM
Oxygen Demand - COD	1,650	mg/L		N/A	EPA 410.1	04/25/97	0830	BJ
Solids - Total Dissolved	3,858	mg/L		10	EPA 160.1	04/18/97	0850	BJ

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By: _____
Gloria Bartlett, Asst Lab Manager

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Giant Refining Co.
Project: Ciniza Refinery
Sample ID: Pond Influent
Lab ID: 0397W00617
Matrix: Water
Condition: Cool/Intact

Date Received: 04/17/97
Date Reported: 06/17/97
Date Sampled: 04/16/97
Time Sampled: 0905

Parameter	Analytical Result	Units	Units	PQL	Method	Analysis Date	Time	Init.
GENERAL PARAMETERS								
Oxygen Demand - BOD	330	mg/L		N/A	EPA 405.1	04/17/97	1230	WM
Oxygen Demand - COD	1,449	mg/L		N/A	EPA 410.1	04/25/97	0830	BJ
Solids - Total Dissolved	7,120	mg/L		10	EPA 160.1	04/18/97	0850	BJ

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes", United States Environmental Protection Agency, EPA 600/4-79-020, Revised March, 1983.

Reviewed By: _____

Gloria Bartlett, Asst. Lab Manager

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

TOTAL ORGANIC CARBON

TOC

Client:	**Giant Refining Co.**		
Project:	Annual Groundwater	Date Reported:	06/17/97
Sample ID:	Pond 1 Influent	Date Analyzed:	04/30/97
Lab ID:	0397W00617	Date Sampled:	04/16/97
Matrix:	Water	Time Sampled:	9:05
Condition:	Cool / Intact	Date Received:	04/17/97

Parameter	Concentration mg/L	Detection Limit mg/L
Total Organic Carbon	150.2	1.0

Concentration is the average of the replicates reported below

Replicate #1	141.1	1.0
Replicate #2	150.3	1.0
Replicate #3	159.2	1.0

ND - Analyte not detected at stated detection limit.

Reference: Method 415.1: TOTAL ORGANIC CARBON (TOC). Test Methods for Evaluating Solid Waste, SW-846, USEPA, 3rd Edition, Final Update II, Sept., 1994.

Comments:

Reported by: _____

Reviewed by: _____

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

TOTAL ORGANIC CARBON

TOC

Client:	**Giant Refining Co.**		
Project:	Annual Groundwater	Date Reported:	06/17/97
Sample ID:	Aeration Lagoon Influent	Date Analyzed:	04/30/97
Lab ID:	0397W00618	Date Sampled:	04/16/97
Matrix:	Water	Time Sampled:	9:15
Condition:	Cool / Intact	Date Received:	04/17/97

Parameter	Concentration mg/L	Detection Limit mg/L
Total Organic Carbon	208.2	1.0

Concentration is the average of the replicates reported below

Replicate #1	217.3	1.0
Replicate #2	205.4	1.0
Replicate #3	202.0	1.0

ND - Analyte not detected at stated detection limit.

Reference: Method 415.1: TOTAL ORGANIC CARBON (TOC). Test Methods for Evaluating Solid Waste, SW-846, USEPA, 3rd Edition, Final Update II, Sept., 1994.

Comments:

Reported by: _____

Reviewed by: _____

Inter-Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
GIANT – ANNUAL Groundwater	CINIZA

Sampler: (Signature) [signature]

Chain of Custody Tape No.

ANALYSES / PARAMETERS

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TOC BOD TDS COD				Remarks
SMW-3-41497	4/14/97	1525		H_2O	6					See attached list.
SMW-4-41497	4/14/97	1345		"	6					
SMW-5-41497	4/14/97	1310		"	6					
MW-1-41597	4/15/97	0920		"	8					
MW-2-41597	4/15/97	1145		"	8					Note:
MW-4-41697	4/16/97	0745		"	8					TOC and TOX
MW-5-41597	4/15/97	1530		"	8					need to have
										two replicates
Pond 1 influent	4/16/97	905				✓				each.
Aeration lagoon										
influent	4/16/97	915				✓				
										cool + intact

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	4/16/97	1030	Chris Rayner	4-17-97	1025
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time

Inter-Mountain Laboratories, Inc.

☐ 1633 Terra Avenue, Sheridan, Wyoming 82801, Telephone (307) 672-8945

☐ 1701 Phillips Circle, Gillette, Wyoming 82718, Telephone (307) 682-8945

☑ 2506 West Main Street, Farmington, NM 87401, Telephone (505) 326-4737

☐ 1160 Research Dr., Bozeman, Montana 59715, Telephone (406) 586-8450

☐ 11183 SH 30, College Station, TX 77845, Telephone (409) 776-8945

46232

1996 OCD ANNUAL REPORT

EXPLANATION OF SAMPLE IDENTIFICATION
Wastewater Treatment

SAMPLE DATE	ID	SAMPLE POINT
1/17/96	OCD 4Q95 - AP1	API Separator (effluent)
1/17/96	OCD 4Q95 - AL2	Aeration Lagoon (effluent)
12/16/96	AL1 - 121696	Aeration Lagoon Inlet (API Separator)
12/16/96	EP1 - 121696	Evaporation Pond 1 Inlet (Aer. Lagoon effluent)

1996 OCD ANNUAL REPORT

EXPLANATION OF SAMPLE IDENTIFICATION
Wastewater Treatment

SAMPLE DATE	ID	SAMPLE POINT
1/17/96	OCD 4Q95 - AP1	API Separator (effluent)
1/17/96	OCD 4Q95 - AL2	Aeration Lagoon (effluent)
12/16/96	AL1 - 121696	Aeration Lagoon Inlet (API Separator)
12/16/96	EP1 - 121696	Evaporation Pond 1 Inlet (Aer. Lagoon effluent)

GIANT
INDUSTRIES, INC.

Route 3, Box 7
Gallup, New Mexico
87301

February 7, 1996

Mr. P. W. Sanchez
State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Dear Mr. Sanchez:

SUBJECT: ANALYTICAL REPORT FOR DISCHARGE PERMIT GW-32 - 4TH QUARTER 95.

On January 17, 1996, water samples were taken from the API separator and the aerated lagoon. This sampling event was to comply with quarterly sampling requirements set out in the GW 32 Discharge Permit. Attached is a hard copy of the analytical results for this sampling event. ATI ID# 601359-01 corresponds to Giant's sample number OCD 4Q95-AP1, which is the API separator, and ATI I # 601359-02 corresponds to Giant's sample number OCD 4Q95-AL2, aerated lagoon.

If there are any questions please contact me at (505) 722-0227.

Sincerely,

Edward L. Horst, Environmental Manager
Giant Refining Company
CINIZA Facility

xc:

David Pavlich, HSE Manager
Steve Morris, Environmental Spec.
File: 4QTR95

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xc:
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Steve Morris, Environmental Spec.
File: 4QTR95

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **601359**

February 3, 1996

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: OCD-WM 4 QTR 95

Attention: Edward Horst

On **01/18/96**, Analytical Technologies, of New Mexico Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 150.1 (pH) analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

All other analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

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February 3, 1996

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Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

AnalyticalTechnologies,Inc.

CLIENT	:GIANT REFINING CO.	DATE RECEIVED	:01/18/96
PROJECT #	:4 QTR 95		
PROJECT NAME	:OCD-WM	REPORT DATE	:02/03/96

ATI ID: 601359

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	601359-01	OCD 4Q95-AP1	AQUEOUS	01/17/96
02	601359-02	OCD 4Q95-AL2	AQUEOUS	01/17/96

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

CLIENT	:GIANT REFINING CO.	DATE RECEIVED	:01/18/96
PROJECT #	:4 QTR 95		
PROJECT NAME	:OCD-WM	REPORT DATE	:02/03/96

ATI ID: 601359

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	601359-01	OCD 4Q95-AP1	AQUEOUS	01/17/96
02	601359-02	OCD 4Q95-AL2	AQUEOUS	01/17/96

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

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The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 601359
PROJECT #	: 4 QTR 95	DATE RECEIVED	: 01/18/96
PROJECT NAME	: OCD-WM	DATE ANALYZED	: 01/19/96

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	8.70	7.61

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 601359
PROJECT #	: 4 QTR 95	DATE RECEIVED	: 01/18/96
PROJECT NAME	: OCD-WM	DATE ANALYZED	: 01/19/96

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	8.70	7.61

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO. ATI I.D. : 601359

PROJECT # : 4 QTR 95 SAMPLE MATRIX : AQUEOUS

PROJECT NAME : OCD-WM

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	60135901	8.70	8.74	0.5	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO. ATI I.D. : 601359
PROJECT # : 4 QTR 95 SAMPLE MATRIX : AQUEOUS
PROJECT NAME : OCD-WM

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	60135901	8.70	8.74	0.5	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 001
Client Sample Id: 601359-01

Sample Date/Time: 17-JAN-96 1225
Received Date: 19-JAN-96

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	>7800	2		BDW007	AB
CHEMICAL OXYGEN DEMAND (410.4)	MG/L	17000	200	+	CHX004	RB
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	16000	5		TDW006	ED

Comments:

API

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
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Test: Group of Single Wetchem
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Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
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CHEMICAL OXYGEN DEMAND (410.4)	MG/L	17000	200	+	CHX004	RB
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	16000	5		TDW006	ED

Comments:

API

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 002
Client Sample Id: 601359-02

Sample Date/Time: 17-JAN-96 1250
Received Date: 19-JAN-96

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	4100	2		BDW007	AB
CHEMICAL OXYGEN DEMAND (410.4)	MG/L	6600	200	+	CHX004	RB
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400	5		TDW006	ED

Comments:

ALZ

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 002
Client Sample Id: 601359-02

Sample Date/Time: 17-JAN-96 1250
Received Date: 19-JAN-96

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	4100	2		BDW007	AB
CHEMICAL OXYGEN DEMAND (410.4)	MG/L	6600	200	+	CHX004	RB
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400	5		TDW006	ED

Comments:

ALZ

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:	
601359-01	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	>7800	API
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	17000	
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	16000	
601359-02	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	4100	AC2.
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	6600	
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400	

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
601359-01	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	>7800 API
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	17000
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	16000
601359-02	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	4100 AC2.
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	6600
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400

AnalyticalTechnologies,Inc.

"WetChem Quality Control Report"

Parameter:	BOD	COD HIGH	TDS
Batch Id:	BDW007	CHX004	TDW006
Blank Result:	<2	<10	<5
Anal. Method:	405.1	410.4	160.1
Prep. Method:	N/A	N/A	N/A
Analysis Date:	24-JAN-96	23-JAN-96	25-JAN-96
Prep. Date:	19-JAN-96	23-JAN-96	22-JAN-96

Sample Duplication

Sample Dup:	601357-1	601355-1	601365-21
Rept Limit:	<2	<200+	<5
Sample Result:	12	17100	750
Dup Result:	12	17240	736
Sample RPD:	0	1	2
Max RPD:	22	5	16
Dry Weight%	N/A	N/A	N/A

Matrix Spike

Sample Spiked:	N/A	601355-1	N/A
Rept Limit:	N/A	<200+	N/A
Sample Result:		17100	
Spiked Result:		31680	
Spike Added:		15000	
% Recovery:		97	
% Rec Limits:		81-117	
Dry Weight%		N/A	

ICV

ICV Result:		660	
True Result:		701	
% Recovery:		94	
% Rec Limits:		90-110	

LCS

LCS Result:	201		337
True Result:	200		293
% Recovery:	101		115
% Rec Limits:	85-115		66-122

AnalyticalTechnologies,Inc.

"WetChem Quality Control Report"

Parameter:	BOD	COD HIGH	TDS
Batch Id:	BDW007	CHX004	TDW006
Blank Result:	<2	<10	<5
Anal. Method:	405.1	410.4	160.1
Prep. Method:	N/A	N/A	N/A
Analysis Date:	24-JAN-96	23-JAN-96	25-JAN-96
Prep. Date:	19-JAN-96	23-JAN-96	22-JAN-96

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Sample Dup:	601357-1	601355-1	601365-21
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Sample Result:	12	17100	750
Dup Result:	12	17240	736
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Max RPD:	22	5	16
Dry Weight%	N/A	N/A	N/A

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Sample Spiked:	N/A	601355-1	N/A
Rept Limit:	N/A	<200+	N/A
Sample Result:		17100	
Spiked Result:		31680	
Spike Added:		15000	
% Recovery:		97	
% Rec Limits:		81-117	
Dry Weight%		N/A	

ICV

ICV Result:		660	
True Result:		701	
% Recovery:		94	
% Rec Limits:		90-110	

LCS

LCS Result:	201		337
True Result:	200		293
% Recovery:	101		115
% Rec Limits:	85-115		66-122

AnalyticalTechnologies,Inc.

"Quality Control Comments"

Batch Id:	Comments:
TDW006	601408-1 WAS ADDED TO BATCH ON 1/23/96.
TDW006	601451-1,2,3,4,5,6,7 WERE ADDED TO BATCH ON 1/24/96.

AnalyticalTechnologies,Inc.

"Quality Control Comments"

Batch Id:	Comments:
TDW006	601408-1 WAS ADDED TO BATCH ON 1/23/96.
TDW006	601451-1,2,3,4,5,6,7 WERE ADDED TO BATCH ON 1/24/96.

AnalyticalTechnologies,Inc.

----- Common Footnotes WetChem -----

N/A = NOT APPLICABLE.
N/S = NOT SUBMITTED.
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.
N/D = NOT DETECTED.
DISS. OR D = DISSOLVED
T & D = TOTAL AND DISSOLVED
R = REACTIVE
T = TOTAL
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO PERCENT RECOVERY BEING OUTSIDE ACCEPTANCE LIMITS ON THE MATRIX (PRE-DIGESTION) SPIKE.
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.
* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE. (DILUTION PRIOR TO ANALYSIS)
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX. (DILUTION PRIOR TO DIGESTION)
P = ANALYTICAL (POST DIGESTION) SPIKE.
I = DUPLICATE INJECTION.
& = AUTOMATED
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
N/C+ = NOT CALCULABLE
N/C* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
H = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW THE REPORTING LIMIT. HOWEVER, THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL". SAMPLE IS NON-HOMOGENEOUS.
(*) = DETECTION LIMITS RAISED DUE TO CLP METHOD NOT REQUIRING A CONCENTRATION STEP FOR CN.

(CA) = SEE CORRECTIVE ACTIONS FORM.

SW-846, 3rd Edition, September 1986 and Revision 1, July 1992.
EPA 600/4-79-020, Revised March 1983.
STANDARD METHODS, 17TH ED., 1989
NIOSH Manual of Analytical Methods, 3rd Edition.
ANNUAL BOOK OF ASTM STANDARDS, VOLUME 11.01, 1991.

1. COLIFORM. COLIFORM PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE LOGARITHM OF COLONIES PER 100 MLS OF SAMPLE ON DUPLICATE PLATES.

2. PH. PH PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS.

3. FLASHPOINT. FLASHPOINT PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS. IF FLASHPOINT IS LESS THAN 25 DEGREES CELSIUS, THE DETECTION LIMIT BECOMES THE INITIAL STARTING TEMPERATURE.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION).

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

DPH = DOLLY P. HWANG	SG = SCOTT GRESHAM	RB = REBECCA BROWN
NC = NICOLE CALL	NSB = NANCY S. BUTLER	MM = MARY MOLONEY
CF = CHRISTINE FOSTER	ED = ESTHER DANTIN	AB = ANDY BROTHERTON
BF = BLANCA FACH		

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BF = BLANCA FACH		

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	601355
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	601359
Project Name:	GIANT
Project Location:	OCD-WM
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	001	Sample Date/Time:	17-JAN-96 1225
Client Sample Id:	601359-01	Received Date:	19-JAN-96
Batch: TOW003		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	24-JAN-96

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	4300	200	
ANALYST	INITIALS	DWB		

Comments:

API

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	601355
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	601359
Project Name:	GIANT
Project Location:	OCD-WM
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	001	Sample Date/Time:	17-JAN-96 1225
Client Sample Id:	601359-01	Received Date:	19-JAN-96
Batch: TOW003		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	24-JAN-96

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	4300	200	
ANALYST	INITIALS	DWB		

Comments:

API

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	601355
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	601359
Project Name:	GIANT
Project Location:	OCD-WM
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	002	Sample Date/Time:	17-JAN-96 1250
Client Sample Id:	601359-02	Received Date:	19-JAN-96
Batch: TOW003		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	24-JAN-96

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	1200	200	
ANALYST	INITIALS	DWB		

Comments:

AL 2

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	601355
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	601359
Project Name:	GIANT
Project Location:	OCD-WM
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	002	Sample Date/Time:	17-JAN-96 1250
Client Sample Id:	601359-02	Received Date:	19-JAN-96
Batch: TOW003		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	24-JAN-96

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	1200	200	
ANALYST	INITIALS	DWB		

Comments:

AL 2

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: TOTAL ORGANIC CARBON

Client Sample Id:	Parameter:	Unit:	Result:
601359-01	TOTAL ORGANIC CARBON	MG/L	4300 API
601359-02	TOTAL ORGANIC CARBON	MG/L	1200 AL2

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: TOTAL ORGANIC CARBON

Client Sample Id:	Parameter:	Unit:	Result:
601359-01	TOTAL ORGANIC CARBON	MG/L	4300 API
601359-02	TOTAL ORGANIC CARBON	MG/L	1200 AL2

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Blank
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Blank Id: A Date Analyzed: 24-JAN-96 Date Extracted: N/A

Parameters:	Units:	Results:	Reporting Limits:
TOTAL ORGANIC CARBON	MG/L	ND	1
ANALYST	INITIALS	DWB	

Comments:

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Blank
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Blank Id: A Date Analyzed: 24-JAN-96 Date Extracted: N/A

Parameters:	Units:	Results:	Reporting Limits:
TOTAL ORGANIC CARBON	MG/L	ND	1
ANALYST	INITIALS	DWB	

Comments:

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Reagent
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

RS Date Analyzed: 24-JAN-96
RSD Date Analyzed: 24-JAN-96

RS Date Extracted: N/A
RSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	6.7	<1	6.5	97	6.6	99	2	30	71-127

Surrogates:

Comments:

Notes:
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT
MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Reagent
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

RS Date Analyzed: 24-JAN-96
RSD Date Analyzed: 24-JAN-96

RS Date Extracted: N/A
RSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	6.7	<1	6.5	97	6.6	99	2	30	71-127

Surrogates:

Comments:

Notes:
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MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
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AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Matrix
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Dry Weight %: N/A
Sample Spiked: 601439-14

MS Date Analyzed: 24-JAN-96
MSD Date Analyzed: 24-JAN-96

MS Date Extracted: N/A
MSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	7	14	21	100	21	100	0	30	51-135

Surrogates:

Comments:

Notes:
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT
MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Matrix
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Dry Weight %: N/A
Sample Spiked: 601439-14

MS Date Analyzed: 24-JAN-96
MSD Date Analyzed: 24-JAN-96

MS Date Extracted: N/A
MSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	7	14	21	100	21	100	0	30	51-135

Surrogates:

Comments:

Notes:
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SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

AnalyticalTechnologies,Inc.

Common notation for Organic reporting

N/S = NOT SUBMITTED
N/A = NOT APPLICABLE
D = DILUTED OUT
UG = MICROGRAMS
UG/L = PARTS PER BILLION.
UG/KG = PARTS PER BILLION.
MG/M3 = MILLIGRAM PER CUBIC METER.
PPMV = PART PER MILLION BY VOLUME.
MG/KG = PARTS PER MILLION.
MG/L = PARTS PER MILLION.
< = LESS THAN DETECTION LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRYWEIGHT BASIS.

ND = NOT DETECTED ABOVE REPORTING LIMIT.

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

ATI/GC/FID
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME IONIZATION DETECTOR (FID).

ATI/GC/FIX
ATI GAS CHROMATOGRAPHIC METHOD FOR ANALYSIS OF FIXED GASES EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD) AND FLAME IONIZATION DETECTOR (FID).

ATI/GC/FPD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME PHOTOMETRIC DETECTOR (FPD) IN SULFUR-SPECIFIC MODE.

ATI/GC/PID
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH PHOTOIONIZATION DETECTOR (PID).

ATI/GC/TCD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD).

LJT = LISA THOMASON
SW = STEVE WILHITE
KW = KAREN WADSWORTH
PL = PAUL LESCHENSKY
RW = ROBERT WOLFE
BV = BEN VAUGHN
KS = KENDALL SMITH
KK = KERRY KUST
DWB = DAVID W. BOWERS
RP = ROB PEREZ

AnalyticalTechnologies,Inc.

Common notation for Organic reporting

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ATI/GC/FIX
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ATI/GC/FPD
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ATI/GC/PID
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ATI/GC/TCD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD).

LJT = LISA THOMASON
SW = STEVE WILHITE
KW = KAREN WADSWORTH
PL = PAUL LESCHENSKY
RW = ROBERT WOLFE
BV = BEN VAUGHN
KS = KENDALL SMITH
KK = KERRY KUST
DWB = DAVID W. BOWERS
RP = ROB PEREZ

AnalyticalTechnologies of New Mexico, Inc.
Albuquerque, New Mexico

Interlab Chain of Custody

60/355 DATE: 1-18-96 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: Analytical Technologies of New Mexico, Inc.
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry	TDS		Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
601359-01	1-17-96	12:25	AQ	1								X		X			X	X															
↓ -02	↓	12:50	AQ	2								X		X			X	X															

PROJECT INFORMATION	
PROJECT NUMBER:	601359
PROJECT NAME:	Giant
QC LEVEL:	(STD.) IV
(QC REQUIRED:)	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	X
PORTLAND	
PHOENIX	

RELINQUISHED BY: 1.
Signature: Dan Johnson Time: 15:14
Printed Name: Dan Johnson Date: 1-18-96
Analytical Technologies of New Mexico, Inc. Albuquerque

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1.
Signature: Rob Elsperman Time: 1013
Printed Name: R. ELSPERMAN Date: 1/19/96
Company: ATI-FL

RECEIVED BY: (LAB) 2.
Signature: Time:
Printed Name: Date:
Company:

DUE DATE: 2-1-96
RUSH SURCHARGE:
CLIENT DISCOUNT: 10%
SPECIAL CERTIFICATION REQUIRED: ☐YES ☐NO

IWO#: KM 1113
BOD 48 hr holdtime

AnalyticalTechnologies of New Mexico, Inc.
Albuquerque, New Mexico

Interlab Chain of Custody

60/355 DATE: 1-18-96 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: Analytical Technologies of New Mexico, Inc.
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry	TDS		Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
601359-01	1-17-96	12:25	AQ	1								X		X			X	X															
↓ -02	↓	12:50	AQ	2								X		X			X	X															

PROJECT INFORMATION	
PROJECT NUMBER:	601359
PROJECT NAME:	Giant
QC LEVEL:	(STD) IV
(QC REQUIRED):	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	X
PORTLAND	
PHOENIX	

DUE DATE: 2-1-96
RUSH SURCHARGE:
CLIENT DISCOUNT: 10%
SPECIAL CERTIFICATION REQUIRED: ☐YES ☐NO

IWO#: KM 1113
BOD 48 hr holdtime

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Dan Johnson Time: 15:14	Signature: Time:
Printed Name: Dan Johnson Date: 1-18-96	Printed Name: Date:
Analytical Technologies of New Mexico, Inc. Albuquerque	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Rob Elsperman Time: 1013	Signature: Time:
Printed Name: R. ELSPERMAN Date: 1/19/96	Printed Name: Date:
Company: ATI-FL	Company:

AnalyticalTechnologies of New Mexico, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque • Anchorage

CHAIN OF CUSTODY

DATE: 1-17-96 PAGE: 1 OF 1

ATI LAB I.D.: 601359

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-0227
FAX: (505) 722-0210

BILL TO: EDWARD L. HORST
COMPANY: SAME
ADDRESS: SAME

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct/Inject	BOD	(M8015) Gas/Purge & Trap	Gasoline/BTEX & MTBE (M8015/8020)	BTXE/MTBE (8020)	BTEX & Chlorinated Aromatics (602/8020)	BTEX/MTBE/EDC & EDB (8020/8010/Short)	Chlorinated Hydrocarbons (601/8010)	COD	504 EDB ☐ / DBCP ☐	Polynuclear Aromatics (610/8310)	Volatile Organics (624/8240) GC/MS	Volatile Organics (8260) GC/MS		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	TOC	General Chemistry:	TDS	pH	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		NUMBER OF CONTAINERS
OCD 4Q[redacted]95-API	1-17-96	12:25	H_2O	-01			X							X									X		X	X							5
OCD 4Q[redacted]95-AL2	1-17-96	12:50	H_2O	-02			X							X									X		X	X							5

PROJECT INFORMATION

PROJ. NO.: 4QTR95
PROJ. NAME: OCD-WVM
P.O. NO.:
SHIPPED VIA: FED EX

SAMPLE RECEIPT

NO. CONTAINERS	10
CUSTODY SEALS	(Y) N / NA
RECEIVED INTACT	Y
BLUE ICE	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

CERTIFICATION REQUIRED: ☐ NM ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: NOT BOD HAS 48 hr. holding time limit

RELINQUISHED BY: 1.
Signature: E.L. Horst Time: 1320 hr. (1:20 PM)
Printed Name: E.L. HORST Date: 1-17-96
Company: GIANT

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB) 2.
Signature: Dan Johnson Time: 14:34
Printed Name: Dan Johnson Date: 1-18-96
Analytical Technologies of New Mexico

AnalyticalTechnologies of New Mexico, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque • Anchorage

CHAIN OF CUSTODY

DATE: 1-17-96 PAGE: 1 OF 1

ATI LAB I.D.: 601359

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-0227
FAX: (505) 722-0210

BILL TO: EDWARD L. HORST
COMPANY: SAME
ADDRESS: SAME

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct/Inject	BOD	(M8015) Gas/Purge & Trap	Gasoline/BTEX & MTBE (M8015/8020)	BTXE/MTBE (8020)	BTEX & Chlorinated Aromatics (602/8020)	BTEX/MTBE/EDC & EDB (8020/8010/Short)	Chlorinated Hydrocarbons (601/8010)	COD	504 EDB ☐ / DBCP ☐	Polynuclear Aromatics (610/8310)	Volatile Organics (624/8240) GC/MS	Volatile Organics (8260) GC/MS		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	TOC	General Chemistry:	TDS	pH	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		NUMBER OF CONTAINERS
OCD 4Q[redacted]95-API	1-17-96	12:25	H_2O	-01			X							X									X		X	X							5
OCD 4Q[redacted]95-AL2	1-17-96	12:50	H_2O	-02			X							X									X		X	X							5

PROJECT INFORMATION

PROJ. NO.: 4QTR95
PROJ. NAME: OCD-WIM
P.O. NO.:
SHIPPED VIA: FED EX

SAMPLE RECEIPT

NO. CONTAINERS	10
CUSTODY SEALS	Y/N/NA
RECEIVED INTACT	Y
BLUE ICE	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

CERTIFICATION REQUIRED: ☐ NM ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: NOT BOD HAS 48 hr. holding time limit

RELINQUISHED BY: 1.
Signature: [signature] Time: 1320 hr. (1:20 PM)
Printed Name: E.L. HORST Date: 1-17-96
Company: GIANT

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB) 2.
Signature: [signature] Time: 14:34
Printed Name: Dan Johnson Date: 1-18-96
Analytical Technologies of New Mexico

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

January 8, 1997

Mr. Steve Morris
Giant Refining, Inc.
Route 3, Box 7
Gallup, NM 87301

Dear Mr. Morris:

Enclosed are the analytical results for the water samples submitted to Inter-Mountain Laboratories - Farmington, New Mexico, on December 18, 1996. The samples were analyzed for BOD, COD, TDS, and TOC, as specified on the accompanying Chain of Custody document #43574.

Tests were performed in accordance with 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis, " as amended.

Please call me if you have any questions or comments concerning the analyses.

Sincerely,

W. Manley

Wanda Manley
Water Lab Supervisor
IML - Farmington

Enclosure: Analytical Report

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

January 8, 1997

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Route 3, Box 7
Gallup, NM 87301

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Sincerely,

W. Manley

Wanda Manley
Water Lab Supervisor
IML - Farmington

Enclosure: Analytical Report

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Giant Industries, Inc.**		
Project:	Giant Ciniza- OCD Waste Water 4th Quarter	Date Reported:	01/08/97
Sample ID:	EP1 - 121696	Date Sampled:	12/18/96
Laboratory ID:	0396W02732	Time Sampled:	1:00 PM
Sample Matrix:	Water	Date Received:	12/18/96
Condition:	Cool/Intact		

Parameter	Analytical Result	Units
Total Dissolved Solids @ 180°C	6,230	mg/L
Biochemical Oxygen Demand	529	mg/L
Chemical Oxygen Demand	1,650	mg/L
Total Organic Carbon	106	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes",.1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Comments:

Reported by LM

Reviewed by CB

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Giant Industries, Inc.**		
Project:	Giant Ciniza- OCD Waste Water 4th Quarter	Date Reported:	01/08/97
Sample ID:	EP1 - 121696	Date Sampled:	12/18/96
Laboratory ID:	0396W02732	Time Sampled:	1:00 PM
Sample Matrix:	Water	Date Received:	12/18/96
Condition:	Cool/Intact		

Parameter	Analytical Result	Units
Total Dissolved Solids @ 180°C	6,230	mg/L
Biochemical Oxygen Demand	529	mg/L
Chemical Oxygen Demand	1,650	mg/L
Total Organic Carbon	106	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes",.1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Comments:

Reported by LM

Reviewed by CB

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Giant Industries, Inc.**		
Project:	Giant Ciniza- OCD Waste Water 4th Quarter	Date Reported:	01/08/97
Sample ID:	AL1 - 121696	Date Sampled:	12/18/96
Laboratory ID:	0396W02733	Time Sampled:	1:20 PM
Sample Matrix:	Water	Date Received:	12/18/96
Condition:	Cool/Intact		

Parameter	Analytical Result	Units
Total Dissolved Solids @ 180°C	4,990	mg/L
Biochemical Oxygen Demand	815	mg/L
Chemical Oxygen Demand	6,150	mg/L
Total Organic Carbon	254	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Comments:

Reported by WM

Reviewed by SB

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Giant Industries, Inc.**		
Project:	Giant Ciniza- OCD Waste Water 4th Quarter	Date Reported:	01/08/97
Sample ID:	AL1 - 121696	Date Sampled:	12/18/96
Laboratory ID:	0396W02733	Time Sampled:	1:20 PM
Sample Matrix:	Water	Date Received:	12/18/96
Condition:	Cool/Intact		

Parameter	Analytical Result	Units
Total Dissolved Solids @ 180°C	4,990	mg/L
Biochemical Oxygen Demand	815	mg/L
Chemical Oxygen Demand	6,150	mg/L
Total Organic Carbon	254	mg/L

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 18th ed., 1992.

Comments:

Reported by WM

Reviewed by SB

Inter- Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
GIANT – OCD – WASTEWATER – 4TH QTR	GIANT – CINIZA

Sampler: (Signature) [signature]

Chain of Custody Tape No.

ANALYSES / PARAMETERS

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TOC	TDS	BOD	COD	Remarks
EPI-121696	12/16/96	1300		H_2O	3	✓	✓	✓	✓	
ALI-121696	12/16/96	1320		H_2O	3	✓	✓	✓	✓	
										cool + intact

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	12/17/96	0900	Chris Rayner	12-18-96	1100
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time

Inter-Mountain Laboratories, Inc.

☐ 1633 Terra Avenue
Sheridan, Wyoming 82801
Telep (307) 672-8945

☐ 1701 Phillips Circle
Gillette, Wyoming 82718
Telephone (307) 682-8945

☒ 2506 West Main Street
Farmington, NM 87401
Telephone (505) 326

☐ 1160 Research Dr.
Bozeman, Montana 59715
Telephone (406) 586-8450

☐ 11183 SH 30
College Station, TX 77845
Telephone (409) 776-8945

43574

Inter- Mountain Laboratories, Inc.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
GIANT – OCD – WASTEWATER – 4TH QTR	GIANT – CINIZA

Sampler: (Signature) [signature]

Chain of Custody Tape No.

ANALYSES / PARAMETERS

Sample No./ Identification	Date	Time	Lab Number	Matrix	No. of Containers	TOC	TDS	BOD	COD	Remarks
EPI-121696	12/16/96	1300		H_2O	3	✓	✓	✓	✓	
ALI-121696	12/16/96	1320		H_2O	3	✓	✓	✓	✓	
										cool + intact

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	12/17/96	0900	Chris Rayner	12-18-96	1100
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by laboratory: (Signature)	Date	Time

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College Station, TX 77845
Telephone (409) 776-8945

43574

Westech Laboratories Inc.
3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8706

CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9205597
INVOICE NO.: 22120861
REPORT DATE: 05-01-92
REVIEWED BY mg AGN
PAGE 1 OF 1

CLIENT SAMPLE ID : API EFFLUENT
SAMPLE TYPE .....: WASTEWATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: API SEPARATOR

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : 3507
SAMPLE DATE ...: 04-20-92
SUBMITTAL DATE : 04-21-92
EXTRACTION DATE: --

Inorganic Non-Metals

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date
Biochemical Oxygen Demand .....:	380.	mg/L	5.	04-21-92
Chemical Oxygen Demand .....:	1100.	mg/L	10.	04-22-92
Total Dissolved Solids .....:	3000.	mg/L	2.0	04-27-92
Total Organic Carbon .....:	150.	mg/L	1.0	04-30-92

1ST QTR
OCD
92

(1) Copy to Client

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3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8706

CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9205598
INVOICE NO.: 22120861
REPORT DATE: 05-01-92
REVIEWED BY: AGK
PAGE : 1 OF 1

CLIENT SAMPLE ID : AER LAG EFF
SAMPLE TYPE .....: WASTEWATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: LAGOON EFFLUENT

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : 3507
SAMPLE DATE ...: 04-20-92
SUBMITTAL DATE : 04-21-92
EXTRACTION DATE: --

Inorganic Non-Metals

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date
Biochemical Oxygen Demand .....:	260.	mg/L	5.	04-21-92
Chemical Oxygen Demand .....:	830.	mg/L	10.	04-22-92
Oil and Grease .....:	20.	mg/L	5.	04-24-92
pH .....:	7.0	S.U.	1.0	04-21-92
Sulfide, Total .....:	4.2	mg/L	0.10	05-06-92
Total Dissolved Solids .....:	4200.	mg/L	2.0	04-27-92
Total Organic Carbon .....:	120.	mg/L	1.0	04-30-92

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CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9205598
INVOICE NO.: 22120861
REPORT DATE: 05-01-92
REVIEWED BY: AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : AER LAG EFF
SAMPLE TYPE .....: WASTEWATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: LAGOON EFFLUENT

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : 3507
SAMPLE DATE ...: 04-20-92
SUBMITTAL DATE : 04-21-92
EXTRACTION DATE: --

Inorganic Chemistry - Total Metals

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date
Total Arsenic .....:	0.06	mg/L	0.05	04-29-92
Total Cadmium .....:	<0.05	mg/L	0.05	04-29-92
Total Chromium .....:	<0.05	mg/L	0.05	04-29-92
Total Lead .....:	<0.10	mg/L	0.10	04-29-92
Total Mercury .....:	0.002	mg/L	0.001	04-30-92
Total Nickel .....:	<0.05	mg/L	0.05	04-29-92
Total Selenium .....:	<0.05	mg/L	0.05	04-29-92

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CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9205598
INVOICE NO.: 22120861
REPORT DATE: 05-01-92
REVIEWED BY: AGN
PAGE 1 OF 1

CLIENT SAMPLE ID : AER LAG EFF
SAMPLE TYPE .....: WASTEWATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: LAGOON EFFLUENT
ANALYST .....: I. HRABOVSKY

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : 3507
SAMPLE DATE ...: 04-20-92
SUBMITTAL DATE : 04-21-92
EXTRACTION DATE: 04-23-92
ANALYSIS DATE .: 04-23-92

Volatile Organics By Capillary GC/MS

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
1,2-Dichloroethane .....:	<5.0	ug/L	5.0
Chloroform .....:	<5.0	ug/L	5.0
Benzene .....:	<5.0	ug/L	5.0
Toluene .....:	<5.0	ug/L	5.0
Ethyl Benzene .....:	<5.0	ug/L	5.0
Chlorobenzene .....:	<5.0	ug/L	5.0
Total Xylenes .....:	<5.0	ug/L	5.0
Metyl ethyl ketone .....:	<100.	ug/L	100.
Carbon Disulfide .....:	<20.	ug/L	20.
1,4-Dioxane .....:	<20.	ug/L	20.
Styrene .....:	<5.0	ug/L	5.0
1,2-Dibromoethane (EDB .....:	<5.0	ug/L	5.0

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Phoenix, Arizona 85040
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CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9205598
INVOICE NO.: 22120861
REPORT DATE: 05-01-92
REVIEWED BY: MG AGN

CLIENT SAMPLE ID : AER LAG EFF
SAMPLE TYPE .....: WASTEWATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: LAGOON EFFLUENT
ANALYST .....: I. HRABOVSKY

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : 3507
SAMPLE DATE ...: 04-20-92
SUBMITTAL DATE : 04-21-92
EXTRACTION DATE: 04-24-92
ANALYSIS DATE .: 04-27-92

Semi-Volatiles by Gas Chromatography/ Mass Spectrometry

D A T A T A B L E

Parameter	Result	Unit	Detection Limit
Phenol	<10.	ug/L	10.
1,3-Dichlorobenzene	<10.	ug/L	10.
1,4-Dichlorobenzene	<10.	ug/L	10.
1,2-Dichlorobenzene	<10.	ug/L	10.
2-Methylphenol	<10.	ug/L	10.
4-Methylphenol	<10.	ug/L	10.
2,4-Dimethylphenol	<10.	ug/L	10.
Napthalene	15.	ug/L	10.
Dimethyl phthalate	<10.	ug/L	10.
2,4-Dinitrophenol	<50.	ug/L	50.
4-Nitrophenol	<50.	ug/L	50.
Diethyl phthalate	11.	ug/L	10.
3-Methylphenol	<10.	ug/L	10.
Phenanthrene	80.	ug/L	10.
Anthracene	<10.	ug/L	10.
Di-n-butyl phthalate	<10.	ug/L	10.
Fluoranthene	<10.	ug/L	10.
Pyrene	17.	ug/L	10.
Butyl benzyl phthalate	<10.	ug/L	10.
Benzo(a)anthracene	<10.	ug/L	10.
Bis(2-ethylhexyl) phthalate	<10.	ug/L	10.
Chrysene	23.	ug/L	10.
Di-n-octyl phthalate	<10.	ug/L	10.
Benzo(b)fluoranthene	<10.	ug/L	10.
Benzo(k)fluoranthene	<10.	ug/L	10.
Benzo(a)pyrene	<10.	ug/L	10.
Dibenzo(a,h)anthracene	<10.	ug/L	10.
7,12-Dimethylbenz(a)-anthracene ..	<10.	ug/L	10.
Indene	<20.	ug/L	20.
1-Methylnaphthalene	<10.	ug/L	10.

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(602) 437-1080 • fax 437-8706

CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9205598
INVOICE NO.: 22120861
REPORT DATE: 05-01-92
REVIEWED BY: AGN
PAGE 2 OF 2

D A T A T A B L E (Cont.)

Parameter	Result	Unit	Detection Limit
Pyridine ..... :	<100.	ug/L	100.
Quinoline ..... :	<20.	ug/L	20.
Benzenethiol ..... :	<20.	ug/L	20.

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Westech Laboratories Inc.
The Quality People
Since 1955

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Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8706

CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9211474
INVOICE NO.: 22121760
REPORT DATE: 08-17-92
REVIEWED BY: AGN
PAGE 1 OF 1

CLIENT SAMPLE ID : API SEPARATOR
SAMPLE TYPE .....: WATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: --

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : --
SAMPLE DATE ...: 07-29-92
SUBMITTAL DATE : 07-30-92
EXTRACTION DATE: --

Inorganic Non-Metals

DATA TABLE

Parameter	Result	Unit	Detection Limit	Analysis Date
Biochemical Oxygen Demand .....:	250.	mg/L	5.	07-31-92
Chemical Oxygen Demand .....:	630.	mg/L	10.	08-14-92
pH .....:	9.39	S.U.	1.00	07-31-92
Total Dissolved Solids .....:	2300.	mg/L	2.0	08-03-92
Total Organic Carbon .....:	240.	mg/L	1.0	08-03-92

2nd QTR
OCD

(1) Copy to Client

Westech Laboratories Inc.
The Quality People
Since 1955

3737 East Broadway Road
Phoenix, Arizona 85040
(602) 437-1080 • fax 437-8706

CLIENT GIANT REFINING COMPANY
ATTN: LYNN SHELTON
ROUTE 3, BOX 7
GALLUP, NM 87301

SAMPLE NO. : 9211475
INVOICE NO. : 22121760
REPORT DATE: 08-17-92
REVIEWED BY: MG. AGN
PAGE : 1 OF 1

CLIENT SAMPLE ID : AERATED LAGOON EFF
SAMPLE TYPE .....: WATER
SAMPLED BY .....: L. SHELTON
SUBMITTED BY ....: L. SHELTON
SAMPLE SOURCE ...: --

AUTHORIZED BY : L. SHELTON
CLIENT P.O. : --
SAMPLE DATE ...: 07-29-92
SUBMITTAL DATE : 07-30-92
EXTRACTION DATE: --

Inorganic Non-Metals

D A T A T A B L E

Parameter	Result	Unit	Detection Limit	Analysis Date
Biochemical Oxygen Demand .....:	230.	mg/L	5.	07-31-92
Chemical Oxygen Demand .....:	370.	mg/L	10.	08-14-92
pH .....:	8.36	S.U.	1.00	07-31-92
Total Dissolved Solids .....:	4200.	mg/L	2.0	08-03-92
Total Organic Carbon .....:	340.	mg/L	1.0	08-03-92

(1) Copy to Client

Westech Laboratories Inc.

Phoenix • 3737 E. Broadway Rd. • AZ 85040 • (602) 437-1080 • fax 437-8706
Flagstaff • 2400 E. Huntington Dr. • AZ 86004 • (602) 774-8708 • fax 774-6469
El Paso • 10737 Gateway West #100 • TX 79935 • (915) 592-3591 • fax 592-3594

CHAIN OF CUSTODY RECORD

CLIENT	ADDRESS
GIANT REFINING CO	R+3 BOX 7
	GALLUP, NM 87301
TELEPHONE (505) 722 0227	PROJECT QUARTERLY OCD
	JOB / P.O. NO.

• REFER TO FEE SCHEDULE FOR ANALYSES SELECTION •

SAMPLER (SIGNATURE): Lynn Shelton
SAMPLER (PLEASE PRINT): LYNN SHELTON

SAMPLE TYPE CODES: S – SOIL, W – WATER, O – OIL, G – SLUDGE, T – TRAVEL BLANK, F – FIELD BLANK, X – OTHER

CLIENT SAMPLE IDENTIFICATION NUMBER	DATE	TIME	SAMPLE LOCATION	HOLD	COMPOSITE	GRAB	SAMPLE TYPE	NUMBER OF CONTAINERS	TDS	TOC	BOD	COD	pH	COMMENTS	LABORATORY SAMPLE IDENTIFICATION NUMBER
API SEPARATOR	7-29	10:30 AM			X		W	1	X	X	X	X	X	REPORT THESE ~~FOUR~~ 5 CONSTITUENTS FOR EACH SAMPLE	9211474
AERATED LAGOON EFF	7-29	10:40 AM			X		W	1	X	X	X	X	X		9211475

RELINQUISHED BY (SIGNATURE)	RECEIVED BY (SIGNATURE)	DATE	TIME	REMARKS
Lynn Shelton	Federal Express			
Federal Express	Grace A. [illegible]	7/30/92	10:30	

Assaigai Analytical Labs
7300 Jefferson NE
Albuquerque, NM 87109

Attn: MARLEAH M. MARTIN
Phone: (505)345-8964

GIANT REFINERY
ROUTE 3 BOX 7
GALLUP, NM 87301

Attn: LYNN SHELTON

Purchase Order: 997-9009-14
Invoice Number:

Order #: 92-10-046
Date: 10/26/92 16:32
Work ID: QUARTELY OCD
Date Received: 10/06/92
Date Completed: 10/26/92

Client Code: GIA01

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	API EFFLUENT
02	AERATED LAGOON-EFFLUENT
03	API EFFLUENT
04	N. STRIPPER
05	S. STRIPPER

ND = None Detected D_F = Dilution Factor NT = Not Tested
B = Analyte was present in the blank J = Estimated value
E = Estimated Value,Concentration exceeds calibration range
MULTIPLY THE LIMIT BY THE DILUTION FACTOR.

Certified By
Marleah Martin

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3711 Admiral, Suite C • El Paso, Texas 79925

REPORT

Work Order # 92-10-046

Received: 10/06/92

Results by Sample

SAMPLE ID API EFFLUENT FRACTION 01B TEST CODE BOD NAME Biochem oxygen demand/H2O
Date & Time Collected 10/05/92 01:25:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Biochemical Oxygen Demand	1.0	1.0	1.0	10/19/92

Notes and Definitions for this Report:

EXTRACTED 10/14/92
ANALYST TP
UNITS mg/L
BATCH_ID WBOD-0020
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

THIS REPORT MUST NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM PRODUCT ENDORSEMENT BY THE NATIONAL LABORATORY VOLUNTARY ACCREDITATION PROGRAM OR ANY OTHER AGENCY OF THE UNITED STATES GOVERNMENT.

NVLAP

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ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3711 Admiral, Suite C • El Paso, Texas 79925

REPORT

Work Order # 92-10-046

Received: 10/06/92

Results by Sample

SAMPLE ID API EFFLUENT FRACTION 01A TEST CODE COD NAME Chemical Oxygen Demand/H2O
Date & Time Collected 10/05/92 01:25:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Chemical Oxygen Demand	700	1.0	1.0	10/09/92

Notes and Definitions for this Report:

EXTRACTED
ANALYST TP
UNITS mg/L
BATCH_ID WCOD-0014
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

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NVLAP

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3711 Admiral, Suite C • El Paso, Texas 79925

REPORT

Work Order # 92-10-046

Received: 10/06/92

Results by Sample

SAMPLE ID API EFFLUENT FRACTION 01C TEST CODE TDS NAME Tot Dis. solids(TDS)/water
Date & Time Collected 10/05/92 01:25:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Dissolved Solids	11,000	1.0	1.0	10/08/92

Notes and Definitions for this Report:

EXTRACTED
ANALYST DH
UNITS mg/L
BATCH_ID WTDS-0019
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

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3711 Admiral, Suite C • El Paso, Texas 79925

Received: 10/06/92

REPORT

Work Order # 92-10-046

Results by Sample

SAMPLE ID API EFFLUENT FRACTION 01D TEST CODE WPH NAME PH in water
Date & Time Collected 10/05/92 01:25:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
pH	11.75	0.10	1.0	10/06/92

Notes and Definitions for this Report:

EXTRACTED
ANALYST TP
UNITS pH Units
BATCH_ID WPH-0031
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

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3711 Admiral, Suite C • El Paso, Texas 79925

Received: 10/06/92

REPORT

Work Order # 92-10-046

Results by Sample

SAMPLE ID API EFFLUENT FRACTION 01E TEST CODE WTOC NAME Total Organic Carbon/water
Date & Time Collected 10/05/92 01:25:00 Category WATER

PARAMETER	RESULT	LIMIT	DATE_ANAL
Total Organic Carbon	85	5.0	10/08/92

Notes and Definitions for this Report:

ANALYST HUF
UNITS mg/L
COMMENTS N/A

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ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3711 Admiral, Suite C • El Paso, Texas 79925

REPORT

Work Order # 92-10-046

Received: 10/06/92

Results by Sample

SAMPLE ID AERATED LAGOON-EFFLUENT FRACTION O2A TEST CODE COD NAME Chemical Oxygen Demand/H2O
Date & Time Collected 10/05/92 13:40:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Chemical Oxygen Demand	1,000	1.0	1.0	10/09/92

Notes and Definitions for this Report:

EXTRACTED
ANALYST TP
UNITS mg/L
BATCH_ID WCOD-0014
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

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3711 Admiral, Suite C • El Paso, Texas 79925

REPORT

Work Order # 92-10-046

Received: 10/06/92

Results by Sample

SAMPLE ID AERATED LAGOON-EFFFLUENT FRACTION 02B TEST CODE BOD NAME Biochem oxygen demand/H2O
Date & Time Collected 10/05/92 13:40:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Biochemical Oxygen Demand	106	1.0	1.0	10/19/92

Notes and Definitions for this Report:

EXTRACTED 10/14/92
ANALYST TP
UNITS mg/L
BATCH_ID WBOD-0020
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

THIS REPORT MUST NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM PRODUCT ENDORSEMENT BY THE NATIONAL LABORATORY VOLUNTARY ACCREDITATION PROGRAM OR ANY OTHER AGENCY OF THE UNITED STATES GOVERNMENT.

NVLAP

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3711 Admiral, Suite C • El Paso, Texas 79925

Received: 10/06/92

REPORT

Work Order # 92-10-046

Results by Sample

SAMPLE ID AERATED LAGOON-EFFFLUENT FRACTION 02C TEST CODE TDS NAME Tot Dis. solids(TDS)/water
Date & Time Collected 10/05/92 13:40:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Total Dissolved Solids	5400	1.0	1.0	10/08/92

Notes and Definitions for this Report:

EXTRACTED
ANALYST DH
UNITS mg/L
BATCH_ID WTDS-0019
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

THIS REPORT MUST NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM PRODUCT ENDORSEMENT BY THE NATIONAL LABORATORY VOLUNTARY ACCREDITATION PROGRAM OR ANY OTHER AGENCY OF THE UNITED STATES GOVERNMENT.

NVLAP

ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3711 Admiral, Suite C • El Paso, Texas 79925

Received: 10/06/92

REPORT
Results by Sample

Work Order # 92-10-046

SAMPLE ID AERATED LAGOON-EFFFLUENT FRACTION 02D TEST CODE WPH NAME PH in water
Date & Time Collected 10/05/92 13:40:00 Category WATER

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
pH	7.85	0.10	1.0	10/06/92

Notes and Definitions for this Report:

EXTRACTED
ANALYST TP
UNITS pH Units
BATCH_ID WPH-0031
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

THIS REPORT MUST NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM PRODUCT ENDORSEMENT BY THE NATIONAL LABORATORY VOLUNTARY ACCREDITATION PROGRAM OR ANY OTHER AGENCY OF THE UNITED STATES GOVERNMENT.

NVLAP

ASSAIGAI
ANALYTICAL LABORATORIES, INC. • 7300 Jefferson, N.E. • Albuquerque, New Mexico 87109
3711 Admiral, Suite C • El Paso, Texas 79925

Received: 10/06/92

REPORT

Work Order # 92-10-046

Results by Sample

SAMPLE ID AERATED LAGOON-EFFFLUENT FRACTION 02E TEST CODE WTOC NAME Total Organic Carbon/water
Date & Time Collected 10/05/92 13:40:00 Category WATER

PARAMETER	RESULT	LIMIT	DATE_ANAL
Total Organic Carbon	231	5.0	10/08/92

Notes and Definitions for this Report:

ANALYST HUF
UNITS mg/L
COMMENTS N/A

Member: American Council of Independent Laboratories, Inc.

THIS REPORT MUST NOT BE USED IN ANY MANNER BY THE CLIENT OR ANY OTHER THIRD PARTY TO CLAIM PRODUCT ENDORSEMENT BY THE NATIONAL LABORATORY VOLUNTARY ACCREDITATION PROGRAM OR ANY OTHER AGENCY OF THE UNITED STATES GOVERNMENT.

NVLAP

Western Atlas International
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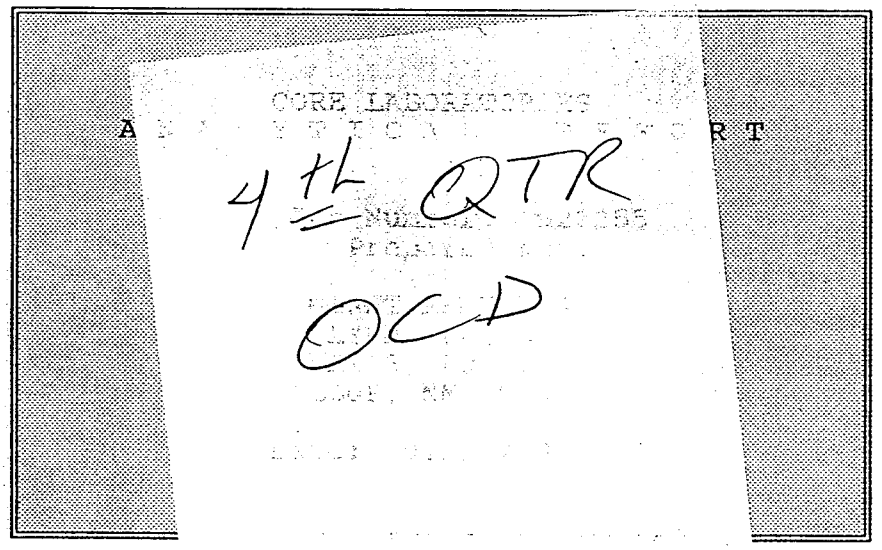
CORE LABORATORIES



Signature: David J. Marshall

Date: 1.26.93

Name: David J. Marshall

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: PROJECT MANAGER

The analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed ... Core Laboratories, however, assumes no responsibility and makes no warranty or representations, express or implied as to the productivity, proper operations, or profitableness of any oil, gas,

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CORE LABORATORIES

LABORATORY TESTS RESULTS
01/26/93

JOB NUMBER: 922255 CUSTOMER: GIANT REFINING ATTN: LYNN SHELTON

SAMPLE NUMBER: 1 DATE RECEIVED: 12/17/92 TIME RECEIVED: 10:00 SAMPLE DATE: 12/16/92 SAMPLE TIME: :
PROJECT: GIANT REFINING SAMPLE: API-EFF REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 12/17/92 TIME RECEIVED: 10:00 SAMPLE DATE: 12/16/92 SAMPLE TIME: :
PROJECT: GIANT REFINING SAMPLE: AER-EFF REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2					UNITS OF MEASURE
Biochemical Oxygen Demand (BOD)	411	167					mg/L
Carbon, Total Organic (TOC)	117	45					mg/L
Chemical Oxygen Demand(COD)-Unfilt	614	622					mg/L
pH (Unfilt.)	8.53	7.82					pH Units
Solids, Total Dissolved (TDS)	2230	4130					mg/L

10703 East Bethany Drive
Aurora, CO 80014
(303) 751-1780

The analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed

10595

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

1300 S. POTOMAC, SUITE 130
AURORA, CO 80012 (303) 751-1780

Analysis Request and Chain of Custody Record

Project No.

Client/Project Name: GIANT REFINING CO.

Project Location: I40 EXIT 39 JAMESTOWN, NM 87347

Lab ID No.	Field Sample No. Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preservative	ANALYSIS REQUESTED	LABORATORY REMARKS
	API EFF	12-16-92	X		1 l. PLASTIC	LIQUID		BOD, COD, TOC, TDS, pH	
	AER EFF	12-16-92	X		1 l. PLASTIC	LIQUID		BOD, COD, TOC, TDS, pH	

Samplers: (Signature) Lynn Shelton

Affiliation: GIANT REFINING CO

Relinquished by: (Signature) Lynn Shelton — Date: Time:

Relinquished by: (Signature) — Date: Time:

Relinquished by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Received by Laboratory: (Signature) Beth Chilson — Date: 12-17-92 Time: 10:00

COC Seal No.

Intact:

REMARKS:

Data Results To: (Name/Address)
1.
2.

Laboratory No. 922256

White - Return With Results Of Analysis Yellow - Lab Copy Pink - Samples Copy

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **304357**

May 5, 1993

Giant Refining
P.O. Box 256
Farmington, NM 87499

Project Name/Number: OCD QTR SPLG

Attention: Lynn Shelton

On **04/14/93**, Analytical Technologies, Inc. received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Total Organic Carbon analyses were performed by ATI, San Diego.

Biochemical Oxygen Demand analyses were performed by Aquatic Consulting & Testing, Inc.

All other analyses were performed by ATI, Phoenix.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski
Assistant Project Manager

E. Proffitt for:
Gregory R. Jordan
Laboratory Manager

GJ:td
Enclosure

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : OCD QTR SPLG

DATE RECEIVED : 04/14/93
REPORT DATE : 05/05/93

ATI I.D. : 304357

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	API EFFLUENT	AQUEOUS	04/13/93
02	AERATION #2 EFF	AQUEOUS	04/13/93

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 304357

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : OCD QTR SPLG

DATE RECEIVED : 04/14/93
REPORT DATE : 05/05/93

PARAMETER	UNITS	01	02
BIOCHEMICAL OXYGEN DEMAND	MG/L	580	375
CHEMICAL OXYGEN DEMAND	MG/L	630	560
PH (EPA 150.1)	UNITS	2.5	7.1
T. DISSOLVED SOLIDS (160.1)	MG/L	5000	5300
TOTAL ORGANIC CARBON	MG/L	110	97.0

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : OCD QTR SPLG

ATI I.D. : 304357

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
BIOCHEMICAL OXYGEN DEM	MG/L	30470501	80	85	6	NA	NA	NA
CHEMICAL OXYGEN DEMAND	MG/L	30472901	450	460	2	720	300	90
PH	UNITS	30480103	7.5	7.4	1	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	30475303	1100	1100	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	30415504	1.9	1.6	17	18.1	20.0	81

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 4-13-93 PAGE 1 OF 1

ATI LAB I.D. 301357

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER: LYNN SHELTON

COMPANY: GIANT REFINING CO.
ADDRESS: I 40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722 0227
FAX: (505) 722 0210

BILL TO: SAME
COMPANY: R+S BOX 7
ADDRESS: GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	BOD	COD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	pH	TDS	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	TOC		SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	4-13-93	8:00	W	1					X	X				X	X						X												4
AERATION #2 EFF	4-13-93	8:20	W	2					X	X				X	X						X												4

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS	8
PROJ. NAME:	OCD QTR SPLG	CUSTODY SEALS	(Y) N / NA
P.O. NO.:	997 9009 14	RECEIVED INTACT	Y
SHIPPED VIA:	FEDEX	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments: 4/14 Fed Ex 951 RT

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Lynn Shelton Time: 11:00am	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 4-13-93	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 951
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

AnalyticalTechnologies,Inc.
Phoenix, Arizona

Ir rlab

Chain of Custody

DATE 4/14/93 PAGE 1 OF 1

NETWORK PROJECT MANAGER: REBECCA TUBESZEWSKI

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: mB

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O_2, CO_2, METHANE, CO, N_2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
304357-1	4/13/93	800	AQ	576																		X									1
-2	4/13/93	820	AQ	577																		X									1

PROJECT INFORMATION	
PROJECT NUMBER:	304357
PROJECT NAME:	
QC LEVEL: STD. IV	
TAT: STANDARD RUSHI	
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	L93-0575, -0576

DUE DATE: 4/27
TIME:

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: R. Tubeszewski Time: 11:15	Signature: Harry Gilgert Time: 11:30
Printed Name: R. Tubeszewski Date: 4/14/93	Printed Name: HARV GILGERT Date: 4.14.93
Analytical Technologies, Inc. Phoenix	Company: TSD
RECEIVED BY: 1.	RECEIVED BY: (LAB) 2.
Signature: Harry Gilgert Time: 11:15	Signature: [illegible] Time:
Printed Name: HARV GILGERT Date: 4-14-93	Printed Name: AMRCEI Date: 4/14/93
Company: TSD	Company: ACHT 1130

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **306377**

July 12, 1993

Giant Refining
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: QTR OCD

Attention: Lynn Shelton

On **06/22/93**, Analytical Technologies, Inc. received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Biochemical Oxygen Demand analysis was performed by Aquatic Consulting & Testing.

Total Organic Carbon analyses were performed by ATI, Fort Collins.

All other analyses were performed by ATI, Phoenix.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski
Assistant Project Manager

Gregory R. Jordan
Laboratory Manager

GJ:td

Enclosure

Analytical Technologies, Inc.

CLIENT : GIANT REFINING
PROJECT # : (NONE)
PROJECT NAME: QTR OCD

DATE RECEIVED: 06/22/93
REPORT DATE : 07/12/93

ATI I.D.: 306377

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	API EFFLUENT	AQUEOUS	06/21/93
02	AER LAGOON EFF	AQUEOUS	06/21/93

----TOTALS----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT : GIANT REFINING
PROJECT # : (NONE)
PROJECT NAME: QTR OCD

ATI I.D. : 306377
DATE RECEIVED: 06/22/93
REPORT DATE : 07/12/93

PARAMETER	UNITS	01	02
BIOCHEMICAL OXYGEN DEMAND	MG/L	392	490
CHEMICAL OXYGEN DEMAND	MG/L	690	650
PH (EPA 150.1)	UNITS	8.3	7.2
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	18000	5800
TOTAL ORGANIC CARBON	MG/L	130	200

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING
PROJECT # : (NONE)
PROJECT NAME: QTR OCD

ATI I.D.: 306377

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
BIOCHEMICAL OXYGEN DEMAND	MG/L	30637701	392	383	2	NA	NA	NA
CHEMICAL OXYGEN DEMAND	MG/L	30698601	360	350	3	650	300	97
PH	UNITS	30637701	8.3	8.3	0	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	30637701	18000	18000	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	30637701	130	130	0	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	30637702	200	200	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins ▪ Portland ▪ Albuquerque

CHAIN OF CUSTODY

DATE: 6-21-93 PAGE 1 OF 1

ATI LAB I.D. 306377

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I-40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722 0227
FAX: (505) 722 0210

BILL TO:
COMPANY: SAME
ADDRESS: RT 3 BOX 7
GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)		TOC	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	6-21		H_2O	01						X																							2
AER LAGOON EFF	6-21		H_2O	02						X																							2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.: —		NO. CONTAINERS	4
PROJ. NAME: QTR OCD		CUSTODY SEALS	Y / N / (NA)
P.O. NO.: 997 9009 14		RECEIVED INTACT	Y
SHIPPED VIA: FEDEX		RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments: Custody Seal on Cooler

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Lynn Shelton Time: 3:00	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 6-21-93	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 0940
Printed Name: Date:	Printed Name: Date:	Printed Name: Terri Dottre Date: 6/21/93
Company:	Company:	Analytical Technologies, Inc.

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins ▪ Portland ▪ Albuquerque

CHAIN OF CUSTODY

DATE: 6-21-93 PAGE 1 OF 1

ATI LAB I.D. 306377

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722 0227
FAX: (505) 722 0210

BILL TO: SAME
COMPANY: Rt 3 Box 7
ADDRESS: GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	pH	TDS	BOD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.		COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	6-21/93	1115	H_2O	1					X		X					X																	3
AER LAGOON EFF	6-21/93	1130	H_2O	2					X		X					X																	3

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.: —		NO. CONTAINERS	8
PROJ. NAME: QTR OCD		CUSTODY SEALS	Y / N / NA
P.O. NO.: 997 9009 14		RECEIVED INTACT	Y
SHIPPED VIA: FED EX		RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Lynn Shelton Time: 3:00	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 6-21-93	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 950
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 6/22/93
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

AnalyticalTechnologies,Inc.
Phoenix, Arizona

Chain of Custody

DATE 6/22/93 PAGE 1 OF 1

NETWORK PROJECT MANAGER: REBECCA TUBESZEWSKI

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: JMT

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
306377-1	6/21/93	1115	AQ	1330																			X									1
-2	6/21/93	1130	AQ	1331																			X									1

PROJECT INFORMATION	
PROJECT NUMBER:	306377
PROJECT NAME:	
QC LEVEL:	(STD) IV
TAT:	STANDARD RUSHI
ATI WORKORDER #	
DUE DATE:	7/6
TIME:	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	N
INTACT?	—
RECEIVED GOOD COND./COLD	✓
LAB NUMBER	[illegible]

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: R. Tubeszewski Time: 13:05	Signature: Time:
Printed Name: R. Tubeszewski Date: 6/22/93	Printed Name: Date
Analytical Technologies, Inc. Phoenix	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Time: 13:05
Printed Name: Date:	Printed Name: Christian Date: 6/22/93
Company:	Company: ACT

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

AnalyticalTechnologies,Inc. Albuquerque, NM

Chain of Custody

DATE 6/22/93 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS	
306377-1	6/21/93		AQ	01		X																												2	TOX
-2	6/21/93		AQ	02		X																												2	TOX

PROJECT INFORMATION	
PROJECT NUMBER:	306377
PROJECT NAME:	GRC
QC LEVEL:	STD. IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS	
INTACT?	NA
RECEIVED GOOD COND./COLD	Yes
LAB NUMBER	93-06-212

DUE DATE: 7-7-93

RUSH SURCHARGE: —

CLIENT DISCOUNT: ____ %

W.O.# 2K501

SAMPLES SENT TO:
- SAN DIEGO
- FT. COLLINS
- RENTON
- PENSACOLA
- PHOENIX
- BARRINGER
- FIBERQUANT

RELINQUISHED BY: 1.
Signature: Terri Dettro Time: 1730
Printed Name: Terri Dettro Date 6/22/93
Analytical Technologies, Inc. Albuquerque

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date
Company: AIRBORNE

RECEIVED BY: (LAB) 1.
Signature: Time:
Printed Name: Date:
Company: AIRBORNE

RECEIVED BY: (LAB) 2.
Signature: Debi Burdick Time: 9:45 a
Printed Name: DEBI BURDICK Date: 6/23/93
Company: ATI

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **309368**

October 13, 1993

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: QTR OCD

Attention: Lynn Shelton

On **09/24/93**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Biochemical Oxygen Demand analyses were performed by Aquatic Consulting & Testing, Inc., 1555 W. University Drive, Suite 103, Tempe, AZ.

Total Organic Carbon analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Adela M. Cantu
Senior Organic Chemist

Letitia Krakowski
Acting Laboratory Manager

LAK:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

DATE RECEIVED : 09/24/93
REPORT DATE : 10/13/93

ATI I.D. : 309368

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	API EFFLUENT	AQUEOUS	09/23/93
02	AERATED LAGOON EFFLUENT	AQUEOUS	09/23/93

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME: QTR OCD

ATI I.D. : 309368
DATE RECEIVED: 09/24/93
DATE ANALYZED: 10/06/93

PARAMETER	UNITS	01	02
TOTAL ORGANIC CARBON	MG/L	148	376

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME: QTR OCD

ATI I.D.: 309368

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
TOTAL ORGANIC CARBON	MG/L	30936801	148	143	3	NA	NA	NA
TOTAL ORGANIC CARBON	MG/L	30936802	376	377	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 309368

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

DATE RECEIVED : 09/24/93
REPORT DATE : 10/13/93

PARAMETER	UNITS	01	02
BIOCHEMICAL OXYGEN DEMAND	MG/L	407	1020
CHEMICAL OXYGEN DEMAND	MG/L	1100	1200
PH (EPA 150.1)	UNITS	8.9	8.1
T. DISSOLVED SOLIDS (160.1)	MG/L	26000	8900

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

ATI I.D. : 309368

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
BIOCHEMICAL OXYGEN DEM	MG/L	30936301	<6	<6	NA	NA	NA	NA
CHEMICAL OXYGEN DEMAND	MG/L	30936802	1200	1300	8	1500	300	100
PH	UNITS	30992102	7.6	7.7	1	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	30937001	480	480	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 9-23-93 PAGE 1 OF 1

ATI LAB I.D. 309368

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722 0227
FAX: (505) 722 0210

BILL TO:
COMPANY: GIANT REFINING CO.
ADDRESS: Rt 3 Box 7
GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	~~BOD, TDS, TOC, #~~		Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	9-23	2:00	H_2O	01					X																								2
AERATED LAGOON EFFLUENT	9-23	1:45	H_2O	02					X																								2

PROJECT INFORMATION

PROJ. NO.:
PROJ. NAME: QTR OCD
P.O. NO.: 997 9023 94
SHIPPED VIA: FED EX

SAMPLE RECEIPT

NO. CONTAINERS	4
CUSTODY SEALS	Y / N / (NA)
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

TOC

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Lynn Shelton Time:	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 9-23-93	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY:(LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1030
Printed Name: Date:	Printed Name: Date:	Printed Name: Terri Dottre Date: 9/24/93
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

93-09-232

AnalyticalTechnologies,Inc. Albuquerque, NM

Chain of Custody

DATE 9/24/93 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
309368-1	9/23/93	1400	AQ	01		X																												2
-2	9/23/93	1345	AQ	02		X																												2

TOX

PROJECT INFORMATION	
PROJECT NUMBER:	309368
PROJECT NAME:	GRC
QC LEVEL:	STD. IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	
LAB NUMBER	93-09-232

DUE DATE: 10/8/93 W.O.# K6667

RUSH SURCHARGE: —

CLIENT DISCOUNT: — %

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	X
RENTON	
PENSACOLA	
PHOENIX	
BARRINGER	
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Terri Dettre Time: 1715	Signature: Time:
Printed Name: Terri Dettre Date 9/24/93	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company: Airborne
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Val Robins Time: 11:30 A
Printed Name: Date:	Printed Name: VAL ROBINS Date: 9/25
Company: Airborne	Company: ATI

Analytical Technologies, Inc.
Phoenix, Arizona

Ir. rlab

Chain of Custody

DATE 9/24/93 PAGE 1 OF 1

NETWORK PROJECT MANAGER: REBECCA TUBESZEWSKI

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: mT

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O_2, CO_2, METHANE, CO, N_2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
309368-1	9/23/93	2:00	AQ	-2218																		X									1
-2	9/23/93	1:45	AQ	-2219																		X									1

PROJECT INFORMATION	
PROJECT NUMBER:	309368
PROJECT NAME:	
QC LEVEL:	STD. IV
TAT:	STANDARD RUSH!
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	N
INTACT?	—
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	L93-2218, -2219

DUE DATE: 10/7
TIME:

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: R. Tubeszewski Time: 1115	Signature: RD Gilbert Time: 11:40
Printed Name: R. Tubeszewski Date: 9/24/93	Printed Name: RD Gilbert Date: 9/24/93
Analytical Technologies, Inc. Phoenix	Company: Tope Spread
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: RD Gilbert Time: 11:5	Signature: Beth Atkinson Time: 11:40
Printed Name: RD Gilbert Date: 9/24/93	Printed Name: A Atkinson Date: 9/24/93
Company: Tope Spread	Company: ATI

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 922255
Prepared For:

GIANT REFINING
LYNN SHELTON
RT 3, BOX 7
GALLUP, NM 87301

Date: 01/26/93

Signature

Date: 1.26.93

Name: David J. Marshall

Core Laboratories
10703 East Bethany Drive
Aurora, CO 80014

Title: PROJECT MANAGER

The analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed represent the best judgement of Core Laboratories. Core Laboratories, however, assumes no responsibility and makes no warranty or representations, express or implied as to the productivity, proper operations, or profitableness of any oil, gas, coal or other mineral, property, well or sand in connection with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, except in its entirety, without the written approval of Core Laboratories.

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

LABORATORY TESTS RESULTS
01/26/93

JOB NUMBER: 922255 CUSTOMER: GIANT REFINING ATTN: LYNN SHELTON

SAMPLE NUMBER: 1 DATE RECEIVED: 12/17/92 TIME RECEIVED: 10:00 SAMPLE DATE: 12/16/92 SAMPLE TIME: :
PROJECT: GIANT REFINING SAMPLE: API-EFF REM:

SAMPLE NUMBER: 2 DATE RECEIVED: 12/17/92 TIME RECEIVED: 10:00 SAMPLE DATE: 12/16/92 SAMPLE TIME: :
PROJECT: GIANT REFINING SAMPLE: AER-EFF REM:

TEST DESCRIPTION	SAMPLE 1	SAMPLE 2					UNITS OF MEASURE
Biochemical Oxygen Demand (BOD)	411	167					mg/L
Carbon, Total Organic (TOC)	117	45					mg/L
Chemical Oxygen Demand(COD)-Unfilt	614	622					mg/L
pH (Unfilt.)	8.53	7.82					pH Units
Solids, Total Dissolved (TDS)	2230	4130					mg/L

10703 East Bethany Drive
Aurora, CO 80014
(303) 751-1780

The analyses, opinions or interpretations contained in this report are based upon observations and material supplied by the client for whose exclusive and confidential use this report has been made. The interpretations or opinions expressed represent the best judgement of Core Laboratories. Core Laboratories, however, assumes no responsibility and makes no warranty or representations, express or implied as to the productivity, proper operations, or profitableness of any oil, gas, coal or other mineral, property, well or sand in connection with which such report is used or relied upon for any reason whatsoever. This report shall not be reproduced, except in its entirety, without the written approval of Core Laboratories.

№ 10995

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

1300 S. POTOMAC, SUITE 130
AURORA, CO 80012 (303) 751-1780

Analysis Request and Chain of Custody Record

Project No.

Client/Project Name: GIANT REFINING CO.

Project Location: I40 EXIT 39 JAMESTOWN, NM 87347

Lab ID No.	Field Sample No. Identification	Date and Time	Grab	Comp	Sample Container (Size/Mat'l)	Sample Type (Liquid Sludge, Etc.)	Preser-vative	ANALYSIS REQUESTED	LABORATORY REMARKS
	API EFF	12-16-92	X		1 l. PLASTIC	LIQUID		BOD, COD, TOC, TDS, pH	
	AER EFF	12-16-92	X		1 l. PLASTIC	LIQUID		BOD, COD, TOC, TDS, pH	

Samplers: (Signature) Lynn Shelton

Affiliation: GIANT REFINING CO

Relinquished by: (Signature) Lynn Shelton — Date: Time:

Relinquished by: (Signature) — Date: Time:

Relinquished by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Received by: (Signature) — Date: Time:

Received by Laboratory: (Signature) Beth Chilson — Date: 12-17-92 Time: 10:00

COC Seal No.

Intact:

REMARKS:

Data Results To: (Name/Address)
1.
2.

Laboratory No. 922256

White - Return With Results Of Analysis Yellow - Lab Copy Pink - Samples Copy

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **403421**

April 19, 1994

Giant Refining Company
I40 Exit 39
Jamestown, NM 87347

Project Name/Number: QTR OCD 1ST QTR

Attention: Lynn Shelton

On **03/29/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA Method 150.1 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

Total Organic Carbon analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

Biochemical Oxygen Demand analysis was performed by Aquatic Consulting & Testing, Inc., 1555 W. University Drive, Suite 103, Tempe, AZ.

All other analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jd

Enclosure

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

DATE RECEIVED : 03/29/94
REPORT DATE : 04/19/94

ATI I.D. : 403421

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	AERATION LAGOON	AQUEOUS	03/28/94
02	API SEPARATOR	AQUEOUS	03/28/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

e samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 403421
PROJECT #	: QTR OCD	DATE RECEIVED	: 03/29/94
PROJECT NAME	: (NONE)	DATE ANALYZED	: 03/29/94

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	7.52	8.22

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO. ATI I.D. : 403421
PROJECT # : QTR OCD SAMPLE MATRIX : AQUEOUS
PROJECT NAME : (NONE)

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	40342101	7.52	7.56	0.53	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 403421

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

DATE RECEIVED : 03/29/94
REPORT DATE : 04/19/94

PARAMETER	UNITS	01	02
BIOCHEMICAL OXYGEN DEMAND	MG/L	113	143
CHEMICAL OXYGEN DEMAND	MG/L	620	990
T. DISSOLVED SOLIDS (160.1)	MG/L	5700	16000

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : (NONE)
PROJECT NAME : QTR OCD ATI I.D. : 403421

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
BIOCHEMICAL OXYGEN DEM	MG/L	40342101	113	124	9	NA	NA	NA
CHEMICAL OXYGEN DEMAND	MG/L	40342101	620	610	2	890	300	90
TOTAL DISSOLVED SOLIDS	MG/L	40342101	5700	5700	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

TOTAL ORGANIC CARBON

Method 415.2

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/28/94

Client Name: ATI-NM

Date Analyzed: 04/11/94

Client Project ID: GRC -- 403421

Sample Matrix: Water

Lab Workorder Number: 94-03-236

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 94-03-236	1	< 1.0	< 1.0	N/A
403421-1	94-03-236-01	0.5	11		
	94-03-236-01DUP	0.5	11	11	0
403421-2	94-03-236-02	0.5	7		
	94-03-236-02DUP	0.5	7	7	0

Analytical Technologies, Inc., Albuquerque, NM
San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins ▪ Portland ▪ Albuquerque

CHAIN OF CUSTODY

DATE: 3-28-94 PAGE 1 OF 1

ATI LAB I.D. 40842

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO
ADDRESS: I40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722 0227
FAX: (505) 722 0210

BILL TO:
COMPANY: SAME
ADDRESS: Rt 3 Box 7
GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	TOC	pH	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
AERATION LAGOON	3-28	2:35	H_2O	01					X	X																							3
API SEPARATOR	3-28	2:45	H_2O	02					X	X																							3

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS	6
PROJ. NAME:	QTR OCD	CUSTODY SEALS	Y / N / (NA)*
P.O. NO.:	997 9023 94	RECEIVED INTACT	Y
SHIPPED VIA:	FED EX	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

*C.O.C. Seals intact on outside of cooler.

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 3:30	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 3-28-94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: [signature] Time: 0900
Printed Name: Date:	Printed Name: Date:	Printed Name: [signature] Date: 3/29/94
Company:	Company:	Analytical Technologies, Inc.

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 3/29/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: [illegible]

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: [illegible]

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD				8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - 02, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
403421-1	3/28/94	2:35	AQ	657																				X									1
" -2	3/28/94	2:45	AQ	658																				X									1

PROJECT INFORMATION	
PROJECT NUMBER: 403421	
PROJECT NAME:	
QC LEVEL: STD/ IV	
TAT: STANDARD RUSH!	
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	
INTACT?	—
RECEIVED GOOD COND./~~COLD~~ COOL	✓
LAB NUMBER	

DUE DATE: 4/3/94
TIME:

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	✓

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: [illegible] Time: 1244	Signature: Time: 13:18
Printed Name: [illegible] Date: 3/29/94	Printed Name: Date 3/29/94
Analytical Technologies, Inc. Phoenix	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: [illegible] Time: 12 [illegible]	Signature: M. McClean Time: 13:18
Printed Name: ED MENDIVIL Date: 3/29/94	Printed Name: M. McClean Date: 3/29/93
Analytical Technologies, Inc.	Company: ACT

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

94-03-236 DATE 3/29/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: **Analytical Technologies, Inc.**
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	632/632 MOD	619/619 MOD	610/8310	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
403421-1	3/28/94	1435	AQ	01		X																			4
-2	3/28/94	1445	AQ	02		X																			4

PROJECT INFORMATION	
PROJECT NUMBER:	403421
PROJECT NAME:	GRC
QC LEVEL:	STD. IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSHI

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS	N
INTACT?	N
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	94-03-236

DUE DATE: 4/12/94 W.O. #LK624
RUSH SURCHARGE:
CLIENT DISCOUNT: 10 %

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	X
RENTON	
PENSACOLA	
PHOENIX	
BARRINGER	
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Terri Dettre Time: 1730	Signature: Time:
Printed Name: Terri Dettre Date: 3/29/94	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company: Anbrani
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Adam Whalen Time: 1000
Printed Name: Date:	Printed Name: John Whalen Date: 3/30/94
Company: Anbrani	Company: ATI-10

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **406390**

July 14, 1994

Giant Refining
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: OCD QTR SPLG 2ND QUARTER

Attention: Lynn Shelton

On **06/22/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Total Organic Carbon analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

Total Dissolved Solids and Chemical Oxygen Demand analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

Biochemical Oxygen Demand analysis was performed by Aquatic Consulting and Testing, 1555 W. University Drive, Suite 103, Tempe, AZ.

EPA Method 150.1 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

CLIENT	: GIANT REFINING	DATE RECEIVED	: 06/22/94
PROJECT #	: 2ND QUARTER		
PROJECT NAME	: OCD QTR SPLG	REPORT DATE	: 07/14/94

ATI ID: 406390

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	API EFFLUENT	AQUEOUS	06/21/94
02	AERATION #2 EFF	AQUEOUS	06/21/94

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING	ATI I.D.	: 406390
PROJECT #	: 2ND QUARTER	DATE RECEIVED	: 06/22/94
PROJECT NAME	: OCD QTR SPLG	DATE ANALYZED	: 06/24/94

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	7.29	7.17

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING
PROJECT # : 2ND QUARTER
PROJECT NAME : OCD QTR SPLG

ATI I.D. : 406390
SAMPLE MATRIX : AQUEOUS

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	40639002	7.17	7.22	0.7	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 406390

CLIENT : GIANT REFINING CO.
PROJECT # : 2ND QUARTER
PROJECT NAME : OCD QTR SPLG

DATE RECEIVED : 06/22/94
REPORT DATE : 07/14/94

PARAMETER	UNITS	01	02
BIOCHEMICAL OXYGEN DEMAND	MG/L	4990	205
CHEMICAL OXYGEN DEMAND	MG/L	12000	760
T. DISSOLVED SOLIDS (160.1)	MG/L	2500	7800

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 2ND QUARTER
PROJECT NAME : OCD QTR SPLG ATI I.D. : 406390

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHEMICAL OXYGEN DEMAND	MG/L	40639002	760	770	1	1040	300	93
TOTAL DISSOLVED SOLIDS	MG/L	40691402	2100	2200	5	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

TOTAL ORGANIC CARBON

Method 415.2

Lab Name: Analytical Technologies, Inc.

Date Collected: 06/21/94

Client Name: ATI-NM

Date Analyzed: 07/07/94

Client Project ID: GRC -- 406390

Sample Matrix: Water

Lab Workorder Number: 94-06-240

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 94-06-240	1	< 1.0	< 1.0	N/A
API Effluent	94-06-240-01	0.1	114		
	94-06-240-01DUP	0.1	118	116	3
Aeration #2 Eff	94-06-240-02	0.01	2700		
	94-06-240-02DUP	0.01	3000	2850	11

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 6-21-94 PAGE 1 OF 1

ATI LAB I.D. 406940 406923

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I 40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722-0212
FAX: (505) 722-0210

BILL TO: SAME
COMPANY: R+3 BOX 7
ADDRESS: GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	BOD	COD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	TDS		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	6-21-94	1:40pm	W	1					X	X				X																			3
AERATION #2 EFF	6-21-94	1:50pm	W	2					X	X				X																			3

PROJECT INFORMATION

PROJ. NO.: 2nd QUARTER
PROJ. NAME: OCD QTR SPLG
P.O. NO.: 997 9009 14
SHIPPED VIA: FED. EX.

SAMPLE RECEIPT

NO. CONTAINERS	6	
CUSTODY SEALS	Y / N	NA
RECEIVED INTACT	Y	
RECEIVED COLD	Y	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 2:00 P.M	Signature: Time:	Signature: Time:
Printed Name: WALT TOOMER Date: 6-21-94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0212	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1130am
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 6/22/94
Company:	Company:	Analytical Technologies, Inc.

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 6-21-94 PAGE 1 OF 1

ATI LAB I.D. 406390

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I 40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722-0212
FAX: (505) 722-0210

BILL TO: SAME
COMPANY: R+3 BOX 7
ADDRESS: GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	PH	TOC	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	6-21-94	1:45 pm	W	01					X	X																							2
AERATION #2 EFF	6-21-94	1:35 p.m.	W	02					X	X																							2

PROJECT INFORMATION

PROJ. NO.: 2nd QUARTER
PROJ. NAME: OCD QTR SPLG
P.O. NO.: 997 9009 14
SHIPPED VIA: FED. EX

SAMPLE RECEIPT

NO. CONTAINERS	4
CUSTODY SEALS	Y / N / NA
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

*C.O.C. Seals intact on outside cooler

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Walter Toomer Time: 2:00 P.M.	Signature: Time:	Signature: Time:
Printed Name: WALT TOOMER Date: 6-21-94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722-0212	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 0945
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 6/22/94
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458 9141 • Phoenix (602) 496 4400 • Seattle (206) 228 8335 • Pensacola (904) 474 1001 • Portland (503) 684 0447 • Albuquerque (505) 344 3777

DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical Technologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 6/22/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: Amy Klinger

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

MT

CLIENT PROJECT MANAGER:

L94-

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD				8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
406923 -01	6/21	1:40pm	W	2044																				X									1
↓ -02	↓	1:30pm	W	2045																				X									1

PROJECT INFORMATION	
PROJECT NUMBER:	406923
PROJECT NAME:	
QC LEVEL: STD. IV	
TAT: STANDARD RUSH	
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 7/6/94
TIME:

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Amy Klinger Time:	Signature: R. Scott Time: 1517
Printed Name: Amy Klinger Date 6/22/94	Printed Name: T Goode Date 6/22/94
Analytical Technologies, Inc. Phoenix	Company: TSD
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: R. Scott Time: 14:33	Signature: M. McClean Time: 1517
Printed Name: T Goode Date: 6/22	Printed Name: M. McCleary Date 6/22/94
Analytical Technologies, Inc. TSD	Company: KC+T

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

DATE 6/22/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: BETH PROFFITT

COMPANY: Analytical Technologies, Inc.

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
406390-1	6/21/94	1345	AQ	01		X																												2
-2	6/21/94	1335	AQ	02		X																												2

2 T

PROJECT INFORMATION	
PROJECT NUMBER:	406390
PROJECT NAME:	GRC
QC LEVEL:	STD. IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS	N
INTACT?	NA
RECEIVED GOOD COND. COLD	Y
LAB NUMBER	

SAMPLES SENT TO:
SAN DIEGO
FT. COLLINS X
RENTON
PENSACOLA
PHOENIX
BARRINGER
FIBERQUANT

DUE DATE: 7/7/94
RUSH SURCHARGE:
CLIENT DISCOUNT: %
$55.00/sample

W.O. #LF857

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Terri Dettle Time: 1730	Signature: Time:
Printed Name: Terri Dettle Date 6/22/94	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company: AIRBORNE
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Time: 10:00
Printed Name: Date:	Printed Name: C. Kelly Date: 6-23-94
Company: AIRBORNE	Company: ATI

ATI Labs: San Diego (619) 458 9141 • Phoenix (602) 496 4400 • Seattle (206) 228-8335 • Pensacola (904) 474 1001 • Portland (503) 684 0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical **Technologies,** Inc. 9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. **408613**

August 30, 1994

Giant Refining Company
I 40 Exit 39
Jamestown, NM 87347

Project Name/Number: OCD QTR SPLG/3rd Quarter

Attention: Walt Toomer

On **08/05/94**, Analytical Technologies, Inc., received a request to analyze **aqueous** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Biochemical Oxygen Demand analysis was performed by Aquatic Consulting & Testing, Inc., 1555 W. University Drive, Suite 103, Tempe, AZ 85281.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Mary A. Tyer

Mary Tyer
Project Manager

MT/paw

Enclosure

ADHS License No. AZ0061
Donald F. Weber, Laboratory Manager

Analytical Technologies, Inc.

CLIENT : GIANT REFINING CO.
PROJECT # : 3RD QUARTER
PROJECT NAME : OCD QTR SPLG

DATE RECEIVED : 08/05/94
REPORT DATE : 08/30/94

ATI I.D. : 408613

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	API EFFLUENT	AQUEOUS	08/04/94
02	AERATION #2 EFF	AQUEOUS	08/04/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 408613

CLIENT : GIANT REFINING CO.
PROJECT # : 3RD QUARTER
PROJECT NAME : OCD QTR SPLG

DATE RECEIVED : 08/05/94
REPORT DATE : 08/30/94

PARAMETER	UNITS	01	02
BIOCHEMICAL OXYGEN DEMAND	MG/L	235	169
CHEMICAL OXYGEN DEMAND	MG/L	850	640
T. DISSOLVED SOLIDS (160.1)	MG/L	5000	8400

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 3RD QUARTER
PROJECT NAME : OCD QTR SPLG ATI I.D. : 408613

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
BIOCHEMICAL OXYGEN DEM	MG/L	40859601	17	16	6	NA	NA	NA
CHEMICAL OXYGEN DEMAND	MG/L	40861301	850	840	1	1200	300	117
TOTAL DISSOLVED SOLIDS	MG/L	40861602	5700	5800	2	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 8.4.94 PAGE 1 OF 1

ATI LAB I.D. 408613

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I 40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722-0212
FAX: (505) 722-0210

BILL TO: SAME
COMPANY: RT 3 BOX 7
ADDRESS: GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	BOD	COD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	TDS		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFFLUENT	8.4.94	10:15 A.M.	W	1					X	X				X																			3
AERATION #2 EFF	8.4.94	10:30 A.M.	W	2					X	X				X																			3

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.: 3RD QUARTER		NO. CONTAINERS	6
PROJ. NAME: OCD QTRSPLG		CUSTODY SEALS	Y / N / NA
P.O. NO.: 9979009 14		RECEIVED INTACT	Y
SHIPPED VIA: FED. EX.		RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 1505	Signature: Time:	Signature: Time:
Printed Name: WALT TOOMER Date: 8/4/94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0212	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Rosella Vidal Time: 0950
Printed Name: Date:	Printed Name: Date:	Printed Name: Rosella Vidal Date: 8/5/94
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical Technologies, Inc.
Phoenix, Arizona

In-lab Chain of Custody

DATE 8/5/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: Amy Klinger

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: MT

L94-

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD				8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
408613-01	8/4	10:15	Wtr	2735																			X									1
↓ 02	↓	10:30	↓	2736																			X									1

PROJECT INFORMATION	
PROJECT NUMBER:	408613
PROJECT NAME:	
QC LEVEL:	STD IV
TAT:	STANDARD RUSHI
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 8/19/94
TIME:

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Amy Klinger Time: 12:17	Signature: Harvey Gilgert Time: 12:30
Printed Name: Amy Klinger Date 8/5/94	Printed Name: HARV GILGERT Date 8-5-94
Analytical Technologies, Inc. Phoenix	Company: TSD
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Harvey Gilgert Time: 12:17	Signature: M. McClearn Time: 1230
Printed Name: HARV GILGERT Date: 8-5-94	Printed Name: M. McCLEARN Date: 8/5/94
Analytical Technologies, Inc. TSD	Company: ACAT

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **408324**

August 30, 1994

Giant Refining Co.
I40 Exit 39
Jamestown, NM 87347

Project Name/Number: OCD QTR SPLG 3RD QUARTER

Attention: Walt Toomer

On **08/05/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous and non-aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Oil and Grease analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

Total Organic Carbon analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

EPA Method 150.1 analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

CLIENT	: GIANT REFINING CO.	DATE RECEIVED	: 08/05/94
PROJECT #	: 3RD QUARTER		
PROJECT NAME	: OCD QTR SPLG	REPORT DATE	: 08/30/94

ATI ID: 408324

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	408324-01	API EFFLUENT	AQUEOUS	08/04/94
02	408324-02	AERATION#2EFF	AQUEOUS	08/04/94
03	408324-03	LTA ZOI 81	NON-AQ	08/04/94
04	408324-04	LTA ZOI 82	NON-AQ	08/04/94
05	408324-05	LTA ZOI 83	NON-AQ	08/04/94
06	408324-06	LTA ZOI 84	NON-AQ	08/04/94

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2
NON-AQ	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 408324
PROJECT #	: 3RD QUARTER	DATE RECEIVED	: 08/05/94
PROJECT NAME	: OCD QTR SPLG	DATE ANALYZED	: 08/05/94

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	3.58	6.76

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 3RD QUARTER
PROJECT NAME : OCD QTR SPLG

ATI I.D. : 408324
SAMPLE MATRIX : AQUEOUS

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	40832401	3.58	3.56	0.56	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 408324

CLIENT : GIANT REFINING CO.
PROJECT # : 3RD QUARTER
PROJECT NAME : OCD QTR SPLG

DATE RECEIVED : 08/05/94
REPORT DATE : 08/29/94

PARAMETER	UNITS	03	04	05	06
OIL AND GREASE, IR (EPA 413.	MG/KG	16000	32000	16000	60000

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 3RD QUARTER
PROJECT NAME : OCD QTR SPLG ATI I.D. : 408324

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
OIL AND GREASE, IR.	MG/KG	40849812	<20	<20	NA	200	210	95

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

TOTAL ORGANIC CARBO..

Method 415.2

Analytical Technologies, Inc.

Lab Name: Analytical Technologies, Inc.

Date Collected: 08/04/94

Client Name: ATI

Date Analyzed: 08/19/94

Client Project ID: 408324

Sample Matrix: Water

Lab Workorder Number: 94-08-080

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 94-08-080	1	< 1.0	< 1.0	N/A
408324-01	94-08-080-01	0.1	108		
	94-08-080-01DUP	0.1	107	107.5	1
408324-02	94-08-080-02	0.1	59		
	94-08-080-02DUP	0.1	58	58.5	2

AnalyticalTechnologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 8.4.94 PAGE 1 OF 1

ATI LAB I.D. 408824

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: I 40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722-0212
FAX: (505) 722-0210

BILL TO: SAME
COMPANY: R+3 BOX 7
ADDRESS: GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	pH	TOC	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	OIL & GREASE		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)	NUMBER OF CONTAINERS
API EFFLUENT	8.4.94	10:15 A.M	W	01					X	X																						2
AERATION #2 EFF	8.4.94	10:30 AM	W	02					X	X																						2
LTA ZOI 81	8-4-94	1000	S	03										X																		1
LTA ZOI 82	8-4-94	1015	S	04										X																		1
LTA ZOI 83	8-4-94	1022	S	05										X																		1
LTA ZOI 84	8-4-94	1027	S	06										X																		1

PROJECT INFORMATION

PROJ. NO.: 3RD QUARTER
PROJ. NAME: OCD QTR SPLG
P.O. NO.: 997 9009 14
SHIPPED VIA: FED. EX.

SAMPLE RECEIPT

NO. CONTAINERS	8
CUSTODY SEALS	(Y) / N / NA
RECEIVED INTACT	Y
RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

Fed Ked.

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 1505	Signature: Time:	Signature: Time:
Printed Name: Walt Toomer Date: 8/4/94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0212	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 0:30
Printed Name: Date:	Printed Name: Date:	Printed Name: Diane Luther Date: 8/5/94
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

DATE 8/5/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: LETITIA KRAKOWSKI

COMPANY: Analytical Technologies, Inc.
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Pat Mitchell Pulst

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	Oil & Grease	632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
408324-01	8-4-94	1015	AQ	1		X																												1
-02		1030	AQ	2		X																												1
-03		1000	NON AQ	3						X																								1
-04		1015		4						X																								1
-05		1022		5						X																								1
-06		1027		6						X																								1

PROJECT INFORMATION	
PROJECT NUMBER:	408324
PROJECT NAME:	GRC
QC LEVEL:	(STD.) IV
QC REQUIRED:	MS MSD BLANK
TAT:	(STANDARD) RUSHI

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	6
CHAIN OF CUSTODY SEALS	* Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	408324

DUE DATE: 8/19/94
RUSH SURCHARGE: 0
CLIENT DISCOUNT: 10 %

* Soil jars only

WO# LK928

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	X
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: [signature] Time: 1730	Signature: Time:
Printed Name: Dianne Lutter Date: 8/5/94	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company:
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Rosella Vidal Time: 1027
Printed Name: Date:	Printed Name: Rosella Vidal Date: 8/6/94
Company:	Company: ATI

Analytical Technologies, Inc.
Phoenix, Arizona

Interlab Chain of Custody

DATE 8/8/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: Amy Klinger

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: MT

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	632/632 MOD	619/619 MOD	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
408324-01	8/4	1015	AQ	01		X																		1
↓ 02	↓	1030	↓	02		X																		1

PROJECT INFORMATION	
PROJECT NUMBER:	408324
PROJECT NAME:	
QC LEVEL:	STD. IV
TAT:	STANDARD RUSHI
ATI WORKORDER #	139

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	94-08-080

DUE DATE: 8/19/94
TIME:

Send Results directly to Abbg.

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	X
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Amy Kyn Time: 6p	Signature: Time:
Printed Name: Amy Klinger Date: 8/8/94	Printed Name: Date
Analytical Technologies, Inc. Phoenix	Company: AIRBORNE
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Debi Burdick Time: 10:00
Printed Name: Date:	Printed Name: DEBI BURDICK Date: 8/9/94
Analytical Technologies, Inc. AIRBORNE	Company: ATI

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical **Technologies,** Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **412355**

January 6, 1995

Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: OCD-WW 4QTR94

Attention: Walt Toomer

On **12/14/94**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Total Organic Carbon analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

EPA Method 150.1 (pH) analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

Chemical Oxygen Demand and Total Dissolved Solids analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

Biochemical Oxygen Demand analysis was performed by Aquatic Consulting & Testing, Inc., 1555 W. University Drive, Suite 103, Tempe, AZ (See Attachment 1).

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

CLIENT	: GIANT REFINING CO.	DATE RECEIVED	: 12/14/94
PROJECT #	: 4QTR94		
PROJECT NAME	: OCD-WW	REPORT DATE	: 01/06/95

ATI ID: 412355

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OCD4QTR94-AP1	AQUEOUS	12/13/94
02	OCD4QTR94-AL2	AQUEOUS	12/13/94

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 412355
PROJECT #	: 4QTR94	DATE RECEIVED	: 12/14/94
PROJECT NAME	: OCD-WW	DATE ANALYZED	: 12/14/94

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	9.22	9.11
		API	ALZ

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 4QTR94
PROJECT NAME : OCD-WW

ATI I.D. : 412355
SAMPLE MATRIX : AQUEOUS

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	41235501	9.22	9.20	0.2	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 412355

CLIENT : GIANT REFINING CO.
PROJECT # : 4QTR94
PROJECT NAME : OCD-WW

DATE RECEIVED : 12/14/94
REPORT DATE : 01/06/95

PARAMETER	UNITS	01	02
CHEMICAL OXYGEN DEMAND	MG/L	690	1500
T. DISSOLVED SOLIDS (160.1)	MG/L	2200	3000
		APF	ALZ

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 4QTR94
PROJECT NAME : OCD-WW

ATI I.D. : 412355

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHEMICAL OXYGEN DEMAND	MG/L	41235501	690	710	3	1030	300	113
TOTAL DISSOLVED SOLIDS	MG/L	41266601	2800	2800	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

TOTAL ORGANIC CARBON

Method 415.2

Analytical Technologies, Inc.

Lab Name: Analytical Technologies, Inc.

Date Collected: 12/13/94

Client Name: ATI-NM

Date Analyzed: 12/21/94

Client Project ID: GRC -- 412355

Sample Matrix: Water

Lab Workorder Number: 94-12-167

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 94-12-167	1	< 1.0	< 1.0	N/A
OCD4QTR94-AP1	94-12-167-01	1	13		
	94-12-167-01DUP	1	13	13	0
OCD4QTR94-AL2	94-12-167-02	1	27		
	94-12-167-02DUP	1	27	27	0

Analytical Technologies, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 12/13/94 PAGE 1 OF 1

ATI LAB I.D. 412355

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-0212
FAX: (505) 722-0210

BILL TO: WALT TOOMER
COMPANY: SAME
ADDRESS: SAME

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	BOD	COD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	TOC	TDS	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	pH		SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
OCD4QTR94-AP1	12/13/94	0920	H_2O	01					X	X				X	X						X												6
OCD4QTR94-AL2	12/13/94	0935 (2)	H_2O	02					X	X				X	X						X												6

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:	4QTR94	NO. CONTAINERS	12
PROJ. NAME:	OCD-WW	CUSTODY SEALS	Y / (N) / NA
P.O. NO.:	—	RECEIVED INTACT	Y
SHIPPED VIA:	FED EX	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Walt Toomer Time: 1000	Signature: Time:	Signature: Time:
Printed Name: WALT TOOMER Date: 12/13/94	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0212	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: D. Cutler Time: 0925
Printed Name: Date:	Printed Name: Date:	Printed Name: Diane Cutler Date: 12/14/94
Company:	Company:	Analytical Technologies, Inc.

Analytical Technologies, Inc. Albuquerque, NM

Chain of Custody

DATE 12/14/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: LETITIA KRAKOWSKI

COMPANY: Analytical Technologies, Inc.

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	TDS	632/632 MOD	619/619 MOD	610/8310	BOD	COD	8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)	NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM	GROSS ALPHA/BETA	RADIUM 226/228	AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
412355-01	12/13	0920	AQ	1						X				X	X													3
-02	↓	0935	↓	2						X				X	X													

PROJECT INFORMATION	
PROJECT NUMBER:	412355
PROJECT NAME:	GRC
QC LEVEL:	(STD) IV
QC REQUIRED:	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	6
CHAIN OF CUSTODY SEALS	NA
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	412355

DUE DATE: 12/29

RUSH SURCHARGE: 0

CLIENT DISCOUNT: 10 %

WO# LK1168

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	X
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Time: 1630	Signature: Time:
Printed Name: Dianne Cutler Date 12/14/94	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company:
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Time:	Signature: Time: 1630
Printed Name: Date:	Printed Name: Linda Stelman Date: 12/14/94
Company:	Company: ATI

Analytical Technologies, Inc.
Phoenix, Arizona

Inter-lab
Chain of Custody

DATE 12/15/94 PAGE 1 OF 1

NETWORK PROJECT MANAGER: Amy Klinger

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: MT

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
412355-01	12/13	0920	HQ	194-48				19														X									1
↓ 02	↓	0930	↓				48	20														X									1

PROJECT INFORMATION	
PROJECT NUMBER:	412-355
PROJECT NAME:	
QC LEVEL:	STD IV
TAT:	STANDARD RUSH
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS	N
INTACT?	N/A
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 12/30/94
TIME:

Possible BioHazard
Use gloves

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Amy Klinger Time: 7:37	Signature: Harvey Gilgert Time: 0800
Printed Name: Amy Klinger Date: 12/15/94	Printed Name: HARV GILGERT Date: 12-15-94
Analytical Technologies, Inc. Phoenix	Company: TSO
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Harvey Gilgert Time: 7:37	Signature: Beth Atkinson Time: 0800
Printed Name: HARV GILGERT Date: 12-15-94	Printed Name: 0800 Date: 12-15-94
Analytical Technologies, Inc. TSO	Company: ACTI

Analytical Technologies, Inc. Albuquerque, NM

94-12-167

Chain of Custody

DATE 12/14/95 PAGE 1 OF 1

NETWORK PROJECT MANAGER: LETITIA KRAKOWSKI

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE	Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
412355-01	12/13	0920	NA	01		X																										2
-02	↓	0935	↓	02		X																										2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER:	412355	TOTAL NUMBER OF CONTAINERS	
PROJECT NAME:	GRC	CHAIN OF CUSTODY SEALS	
QC LEVEL:	STD. IV	INTACT?	
QC REQUIRED:	MS MSD BLANK	RECEIVED GOOD COND./COLD	
TAT:	STANDARD RUSHI	LAB NUMBER	

DUE DATE: 12/29
RUSH SURCHARGE: 0
CLIENT DISCOUNT: 10 %

WO# LK1169

SAMPLES SENT TO:
- SAN DIEGO
- FT. COLLINS X
- RENTON
- PENSACOLA
- PORTLAND
- PHOENIX
- FIBERQUANT

RELINQUISHED BY: 1.
Signature: Time: 1730
Printed Name: Date 12/14/94
Analytical Technologies, Inc. Albuquerque
Company: FED-X

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date
Company:

RECEIVED BY: (LAB) 1.
Signature: Time:
Printed Name: Date:
Company: FED-X

RECEIVED BY: (LAB) 2.
Signature: Time: 9:30
Printed Name: Date: 12-15-94
Company: ATI

ATTACHMENT 1

AQUATIC CONSULTING & TESTING, INC.

1555 W. University Drive, Suite 103
P.O. Box 1510
Tempe, Arizona 85281
Phone: (602) 921-8044 • Fax: (602) 921-0049

Lic. No. AZ0003

LABORATORY REPORT

CLIENT: **Analytical Technologies, Inc.**
9830 S. 51st Street, Suite B-113
Phoenix, AZ 85044

DATE SUBMITTED: 12/15/94
DATE REPORTED: 12/27/94

ATTN: **Amy Klinger**

PO#: - - -

SUBMITTED BY: Top Speed Delivery
SAMPLE TYPE: Aqueous
SAMPLE DATE: See C.O.C
METHOD NO.: EPA 405.1

RESULTS

Client Sample I.D.	Analysis Date	AC & T Lab Number	BOD5, mg/L	
412355-01	12/15-20/94	L94-4819	210	API
412355-02	12/15-20/94	L94-4820	526	ALZ

Reviewed by: Frederick A Amalfi

Frederick A. Amalfi, Ph.D.
Laboratory Director

File No. L94-4819.XLS

AQUAT C CONSULTING & TEST G, INC.

1555 W. University Drive, Suite 103
P.O. Box 1510
Tempe, Arizona 85281
Phone: (602) 921-8044 • Fax: (602) 921-0049

Lic. No. AZ0003

QUALITY CONTROL REPORT

PARAMETER: BOD5
METHOD NO.: 405.1
ANALYSIS DATE: 12/15-20/94

UNITS: mg/L
PREPARED BY: CJC

INTERNAL QUALITY CONTROL SAMPLE

Theoretical Value	Analytical Value	% Recovery
198	193	97

DUPLICATE SAMPLE DATA

Lab I.D.	Result 1	Result 2	RPD
L94-4820	522	529	1.3

SPIKED SAMPLE DATA

Lab I.D.	Sample Result	Spike Result	Amount Spiked	% Recovery
L94-4820	---	---	---	100

File No. QC4820.XLS

GIANT
INDUSTRIES, INC.

Route 3, Box 7
Gallup, New Mexico
87301

February 7, 1996

Mr. P. W. Sanchez
State of New Mexico
Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

Dear Mr. Sanchez:

SUBJECT: ANALYTICAL REPORT FOR DISCHARGE PERMIT GW-32 - 4TH QUARTER 95.

On January 17, 1996, water samples were taken from the API separator and the aerated lagoon. This sampling event was to comply with quarterly sampling requirements set out in the GW 32 Discharge Permit. Attached is a hard copy of the analytical results for this sampling event. ATI ID# 601359-01 corresponds to Giant's sample number OCD 4Q95-AP1, which is the API separator, and ATI I # 601359-02 corresponds to Giant's sample number OCD 4Q95-AL2, aerated lagoon.

If there are any questions please contact me at (505) 722-0227.

Sincerely,

Edward L. Horst, Environmental Manager
Giant Refining Company
CINIZA Facility

xc:

David Pavlich, HSE Manager
Steve Morris, Environmental Spec.
File: 4QTR95

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **601359**

February 3, 1996

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: OCD-WM 4 QTR 95

Attention: Edward Horst

On **01/18/96**, Analytical Technologies, of New Mexico Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 150.1 (pH) analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

All other analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

AnalyticalTechnologies,Inc.

CLIENT	: GIANT REFINING CO.	DATE RECEIVED	: 01/18/96
PROJECT #	: 4 QTR 95		
PROJECT NAME	: OCD-WM	REPORT DATE	: 02/03/96

ATI ID: 601359

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	601359-01	OCD 4Q95-AP1	AQUEOUS	01/17/96
02	601359-02	OCD 4Q95-AL2	AQUEOUS	01/17/96

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 601359
PROJECT #	: 4 QTR 95	DATE RECEIVED	: 01/18/96
PROJECT NAME	: OCD-WM	DATE ANALYZED	: 01/19/96

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	8.70	7.61

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO. ATI I.D. : 601359
PROJECT # : 4 QTR 95 SAMPLE MATRIX : AQUEOUS
PROJECT NAME : OCD-WM

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	60135901	8.70	8.74	0.5	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 001
Client Sample Id: 601359-01

Sample Date/Time: 17-JAN-96 1225
Received Date: 19-JAN-96

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	>7800	2		BDW007	AB
CHEMICAL OXYGEN DEMAND (410.4)	MG/L	17000	200	+	CHX004	RB
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	16000	5		TDW006	ED

Comments:

API

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 002
Client Sample Id: 601359-02

Sample Date/Time: 17-JAN-96 1250
Received Date: 19-JAN-96

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	4100	2		BDW007	AB
CHEMICAL OXYGEN DEMAND (410.4)	MG/L	6600	200	+	CHX004	RB
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400	5		TDW006	ED

Comments:

AL2

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:	
601359-01	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	>7800	API
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	17000	
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	16000	
601359-02	BIOCHEMICAL OXYGEN DEMAND (405.1)	MG/L	4100	AL2.
	CHEMICAL OXYGEN DEMAND (410.4)	MG/L	6600	
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6400	

AnalyticalTechnologies,Inc.

"WetChem Quality Control Report"

Parameter:	BOD	COD HIGH	TDS
Batch Id:	BDW007	CHX004	TDW006
Blank Result:	<2	<10	<5
Anal. Method:	405.1	410.4	160.1
Prep. Method:	N/A	N/A	N/A
Analysis Date:	24-JAN-96	23-JAN-96	25-JAN-96
Prep. Date:	19-JAN-96	23-JAN-96	22-JAN-96

Sample Duplication

Sample Dup:	601357-1	601355-1	601365-21
Rept Limit:	<2	<200+	<5
Sample Result:	12	17100	750
Dup Result:	12	17240	736
Sample RPD:	0	1	2
Max RPD:	22	5	16
Dry Weight%	N/A	N/A	N/A

Matrix Spike

Sample Spiked:	N/A	601355-1	N/A
Rept Limit:	N/A	<200+	N/A
Sample Result:		17100	
Spiked Result:		31680	
Spike Added:		15000	
% Recovery:		97	
% Rec Limits:		81-117	
Dry Weight%		N/A	

ICV

ICV Result:		660	
True Result:		701	
% Recovery:		94	
% Rec Limits:		90-110	

LCS

LCS Result:	201		337
True Result:	200		293
% Recovery:	101		115
% Rec Limits:	85-115		66-122

AnalyticalTechnologies,Inc.

"Quality Control Comments"

Batch Id:	Comments:
TDW006	601408-1 WAS ADDED TO BATCH ON 1/23/96.
TDW006	601451-1,2,3,4,5,6,7 WERE ADDED TO BATCH ON 1/24/96.

AnalyticalTechnologies,Inc.

----- Common Footnotes WetChem -----

N/A = NOT APPLICABLE.
N/S = NOT SUBMITTED.
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.
N/D = NOT DETECTED.
DISS. OR D = DISSOLVED
T & D = TOTAL AND DISSOLVED
R = REACTIVE
T = TOTAL
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO PERCENT RECOVERY BEING OUTSIDE ACCEPTANCE LIMITS ON THE MATRIX (PRE-DIGESTION) SPIKE.
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.
* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE. (DILUTION PRIOR TO ANALYSIS)
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX. (DILUTION PRIOR TO DIGESTION)
P = ANALYTICAL (POST DIGESTION) SPIKE.
I = DUPLICATE INJECTION.
& = AUTOMATED
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
N/C+ = NOT CALCULABLE
N/C* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
H = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW THE REPORTING LIMIT. HOWEVER, THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL". SAMPLE IS NON-HOMOGENEOUS.
(*) = DETECTION LIMITS RAISED DUE TO CLP METHOD NOT REQUIRING A CONCENTRATION STEP FOR CN.

(CA) = SEE CORRECTIVE ACTIONS FORM.

SW-846, 3rd Edition, September 1986 and Revision 1, July 1992.
EPA 600/4-79-020, Revised March 1983.
STANDARD METHODS, 17TH ED., 1989
NIOSH Manual of Analytical Methods, 3rd Edition.
ANNUAL BOOK OF ASTM STANDARDS, VOLUME 11.01, 1991.

1. COLIFORM. COLIFORM PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE LOGARITHM OF COLONIES PER 100 MLS OF SAMPLE ON DUPLICATE PLATES.

2. PH. PH PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS.

3. FLASHPOINT. FLASHPOINT PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS. IF FLASHPOINT IS LESS THAN 25 DEGREES CELSIUS, THE DETECTION LIMIT BECOMES THE INITIAL STARTING TEMPERATURE.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION).

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

DPH = DOLLY P. HWANG	SG = SCOTT GRESHAM	RB = REBECCA BROWN
NC = NICOLE CALL	NSB = NANCY S. BUTLER	MM = MARY MOLONEY
CF = CHRISTINE FOSTER	ED = ESTHER DANTIN	AB = ANDY BROTHERTON
BF = BLANCA FACH		

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	601355
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	601359
Project Name:	GIANT
Project Location:	OCD-WM
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	001	Sample Date/Time:	17-JAN-96 1225
Client Sample Id:	601359-01	Received Date:	19-JAN-96
Batch: TOW003		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	24-JAN-96

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	4300	200	
ANALYST	INITIALS	DWB		

Comments:

API

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	601355
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	601359
Project Name:	GIANT
Project Location:	OCD-WM
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	002	Sample Date/Time:	17-JAN-96 1250
Client Sample Id:	601359-02	Received Date:	19-JAN-96
Batch: TOW003		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	24-JAN-96

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	1200	200	
ANALYST	INITIALS	DWB		

Comments:

AL 2

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 601355
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 601359
Project Name: GIANT
Project Location: OCD-WM
Test: TOTAL ORGANIC CARBON

Client Sample Id:	Parameter:	Unit:	Result:
601359-01	TOTAL ORGANIC CARBON	MG/L	4300 API
601359-02	TOTAL ORGANIC CARBON	MG/L	1200 AL2

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Blank
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Blank Id: A Date Analyzed: 24-JAN-96 Date Extracted: N/A

Parameters:	Units:	Results:	Reporting Limits:
TOTAL ORGANIC CARBON	MG/L	ND	1
ANALYST	INITIALS	DWB	

Comments:

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Reagent
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

RS Date Analyzed: 24-JAN-96
RSD Date Analyzed: 24-JAN-96

RS Date Extracted: N/A
RSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	6.7	<1	6.5	97	6.6	99	2	30	71-127

Surrogates:

Comments:

Notes:
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT
MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

AnalyticalTechnologies,Inc.

"QC Report"

Title: Water Matrix
Batch: TOW003
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Dry Weight %: N/A
Sample Spiked: 601439-14

MS Date Analyzed: 24-JAN-96
MSD Date Analyzed: 24-JAN-96

MS Date Extracted: N/A
MSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	7	14	21	100	21	100	0	30	51-135

Surrogates:

Comments:

Notes:
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT
MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

AnalyticalTechnologies,Inc.

Common notation for Organic reporting

N/S = NOT SUBMITTED
N/A = NOT APPLICABLE
D = DILUTED OUT
UG = MICROGRAMS
UG/L = PARTS PER BILLION.
UG/KG = PARTS PER BILLION.
MG/M3 = MILLIGRAM PER CUBIC METER.
PPMV = PART PER MILLION BY VOLUME.
MG/KG = PARTS PER MILLION.
MG/L = PARTS PER MILLION.
< = LESS THAN DETECTION LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRYWEIGHT BASIS.

ND = NOT DETECTED ABOVE REPORTING LIMIT.

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

ATI/GC/FID
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME IONIZATION DETECTOR (FID).

ATI/GC/FIX
ATI GAS CHROMATOGRAPHIC METHOD FOR ANALYSIS OF FIXED GASES EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD) AND FLAME IONIZATION DETECTOR (FID).

ATI/GC/FPD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME PHOTOMETRIC DETECTOR (FPD) IN SULFUR-SPECIFIC MODE.

ATI/GC/PID
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH PHOTOIONIZATION DETECTOR (PID).

ATI/GC/TCD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD).

LJT = LISA THOMASON
SW = STEVE WILHITE
KW = KAREN WADSWORTH
PL = PAUL LESCHENSKY
RW = ROBERT WOLFE
BV = BEN VAUGHN
KS = KENDALL SMITH
KK = KERRY KUST
DWB = DAVID W. BOWERS
RP = ROB PEREZ

AnalyticalTechnologies of New Mexico, Inc.
Albuquerque, New Mexico

Interlab Chain of Custody

601355 DATE: 1-18-96 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: **Analytical Technologies of New Mexico, Inc.**
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry	TDS		Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
601359-01	1-17-96	12:25	AQ	1								X		X			X	X															
↓ -02	↓	12:50	AQ	2								X		X			X	X															

PROJECT INFORMATION	
PROJECT NUMBER:	601359
PROJECT NAME:	Giant
QC LEVEL:	(STD) IV
(QC REQUIRED)	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	X
PORTLAND	
PHOENIX	

DUE DATE: 2-1-96
RUSH SURCHARGE:
CLIENT DISCOUNT: 10%
SPECIAL CERTIFICATION REQUIRED: ☐ YES ☐ NO

IWO#: KM 1113
BOD 48 hr holdtime

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Dan Johnson Time: 15:14	Signature: Time:
Printed Name: Dan Johnson Date: 1-18-96	Printed Name: Date:
Analytical Technologies of New Mexico, Inc. Albuquerque	Company:
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: Robert Elsperman Time: 1013	Signature: Time:
Printed Name: R. ELSPERMAN Date: 1/19/96	Printed Name: Date:
Company: ATI-FL	Company:

AnalyticalTechnologies of New Mexico, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque • Anchorage

CHAIN OF CUSTODY

DATE: 1-17-96 PAGE: 1 OF 1

ATI LAB I.D. 601359

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-0227
FAX: (505) 722-0210

BILL TO: EDWARD L. HORST
COMPANY: same
ADDRESS: SAME

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct/Inject	BOD	(M8015) Gas/Purge & Trap	Gasoline/BTEX & MTBE (M8015/8020)	BTXE/MTBE (8020)	BTEX & Chlorinated Aromatics (602/8020)	BTEX/MTBE/EDC & EDB (8020/8010/Short)	Chlorinated Hydrocarbons (601/8010)	COD	504 EDB ☐ / DBCP ☐	Polynuclear Aromatics (610/8310)	Volatile Organics (624/8240) GC/MS	Volatile Organics (8260) GC/MS		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	TOC	General Chemistry:	TDS	pH	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:		NUMBER OF CONTAINERS
OCD 4Q[redacted]95-API	1-17-96	12:25	H_2O	-01			X							X									X		X	X							5
OCD 4Q[redacted]95-AL2	1-17-96	12:50	H_2O	-02			X							X									X		X	X							5

PROJECT INFORMATION

PROJ. NO.: 4QTR95
PROJ. NAME: OCD-WIM
P.O. NO.:
SHIPPED VIA: FED EX

SAMPLE RECEIPT

NO. CONTAINERS	10
CUSTODY SEALS	(Y) N / NA
RECEIVED INTACT	Y
BLUE ICE/ICE	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

CERTIFICATION REQUIRED: ☐ NM ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: NOT BOD HAS 48 hr. holding time limit

RELINQUISHED BY: 1.
Signature: [signature] Time: 1320 hr. (1:20 PM)
Printed Name: E.L. HORST Date: 1-17-96
Company: GIANT

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB) 2.
Signature: [signature] Time: 14:34
Printed Name: Dan Johnson Date: 1-18-96
Analytical Technologies of New Mexico

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **504300**

April 24, 1995

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: OCD WW 1ST QTR 95

Attention: Walt Toomer

On **04/03/95**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Chemical Oxygen Demand and Total Dissolved Solids analyses were performed by Analytical Technologies, Inc., 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

Biochemical Oxygen Demand (BOD) analysis was performed by Aquatic Consulting & Testing, Inc., 1525 W. University Drive, Suite 106, Tempe, AZ 85281 (See attachment 1)

All other analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

Samples were received after the 48 hour holding time for BOD had expired.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Letitia Krakowski, Ph.D.
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

CLIENT	: GIANT REFINING CO.	DATE RECEIVED	: 04/03/95
PROJECT #	: 1ST QTR 95		
PROJECT NAME	: OCD WW	REPORT DATE	: 04/24/95

ATI ID: 504300

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	APIEFF	AQUEOUS	03/31/95
02	ALZEFF AL2 HS	AQUEOUS	03/31/95

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 504300

CLIENT : GIANT REFINING CO.
PROJECT # : 1ST QTR 95
PROJECT NAME : OCD WW

DATE RECEIVED : 04/03/95
REPORT DATE : 04/24/95

PARAMETER	UNITS	01	02
CHEMICAL OXYGEN DEMAND	MG/L	860	880
T. DISSOLVED SOLIDS (160.1)	MG/L	4500	6100

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO.
PROJECT # : 1ST QTR 95
PROJECT NAME : OCD WW ATI I.D. : 504300

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHEMICAL OXYGEN DEMAND	MG/L	50430002	880	870	1	1200	300	107
TOTAL DISSOLVED SOLIDS	MG/L	50451501	490	510	4	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

TOTAL ORGANIC CARBON

Method 415.2

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/31/95

Client Name: ATI-NM

Date Analyzed: 04/11/95

Client Project ID: GRC -- 504300

Sample Matrix: Water

Lab Workorder Number: 95-04-009

Sample ID	Lab Sample ID	Volume Injected (mL)	TOC Conc. (mg/L)	TOC AVG	RPD
Reagent Blank	RB 95-04-009	1	< 1.0	< 1.0	N/A
APIEFF	95-04-009-01	0.05	178		
	95-04-009-01DUP	0.05	175	176.5	2
ALZEFF	95-04-009-02	0.05	210		
	95-04-009-02DUP	0.05	206	208	2

Analytical **Technologies,** Inc.

pH
Method 9045

Lab Name: Analytical Technologies, Inc.

Date Collected: 03/31/95

Client Name: ATI-NM

Date Analyzed: 04/04/95

Client Project ID: GRC -- 504300

Sample Matrix: Water

Lab Workorder Number: 95-04-009

Sample ID	Lab Sample ID	pH
APIEFF	95-04-009-01	9.0
ALZEFF	95-04-009-02	7.5

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 3/31/95 PAGE 1 OF 1

ATI LAB I.D.: 504308

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-3833
FAX: (505) 722-0210

BILL TO: WALTER D. TOOMER
COMPANY: SAME
ADDRESS: SAME

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	BOD	COD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.	TSS		Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFF	3/31/95	1440	H_2O	1					X																								1
API EFF	3/31/95	1440	H_2O							X																							1
API EFF	3/31/95	1440	H_2O											X																			1
AL2 EFF	3/31/95	1435	H_2O	2					X																								1
AL2 EFF	3/31/95	1435	H_2O							X																							1
AL2 EFF	3/31/95	1435	H_2O											X																			1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:	1ST QTR 95	NO. CONTAINERS	6
PROJ. NAME:	OCD WIN	CUSTODY SEALS	Y / N / NA
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:	FED EX	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: [signature] Time: 08600	Signature: Time:	Signature: Time:
Printed Name: WALT TOOMER Date: 04/01/95	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0212	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: [signature] Time: 1006
Printed Name: Date:	Printed Name: Date:	Printed Name: Melanie Giancuzzo Date: 4/3/95
Company:	Company:	Analytical Technologies, Inc.

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque

CHAIN OF CUSTODY

DATE: 3/31/95 PAGE 1 OF 1

ATI LAB I.D. 50430B0

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING CO.
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: (505) 722-3833
FAX: (505) 722-0210

BILL TO: WALTER D. TOOMER
COMPANY: SAME
ADDRESS: SAME

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	TOC	TPH	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API EFF	3/31/95		AQ	01					X																								2
API EFF	3/31/95			020						X																							1
ALZ EFF	3/31/95			0302					X																								2
ALZ EFF	3/31/95			0402						X																							1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:	1ST QTR 95	NO. CONTAINERS	6
PROJ. NAME:	OCD WW	CUSTODY SEALS	Y N NA
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:	FED EX	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments: Sealson cooler

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Walter D. Toomer Time: 0800	Signature: Time:	Signature: Time:
Printed Name: WALT TOOMER Date: 04/01/95	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: (505) 722-0210	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 1225
Printed Name: Date:	Printed Name: Date:	Printed Name: Daniel Lucker Date: 4/3/95
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

AnalyticalTechnologies,Inc. Albuquerque, NM

Chain of Custody 9504-009

DATE 4/3/95 PAGE 1 OF 1

NETWORK PROJECT MANAGER: LETITIA KRAKOWSKI

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	Ph	632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O_2, CO_2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
504300 -01	3/31	/	AQ			X				X																							3
-02	↓	/	↓			X				X																							3

2 TO 1 EXI

PROJECT INFORMATION	
PROJECT NUMBER:	504300
PROJECT NAME:	GRC
QC LEVEL:	STD IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	6
CHAIN OF CUSTODY SEALS	NA
INTACT?	NA
RECEIVED GOOD COND/COLD	Y
LAB NUMBER	

DUE DATE: 4/17

RUSH SURCHARGE: 0

CLIENT DISCOUNT: See Inv.

WO# 13601

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	X
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: D Letter Time: 1730	Signature: Time:
Printed Name: Diane Letter Date: 4/3/95	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company: FED-X
RECEIVED BY: (LAB) 1.	RECEIVED BY: (LAB) 2.
Signature: Time:	Signature: Time: 9:00
Printed Name: Date:	Printed Name: L. Kelly Date: 4-4-95
Company: FED-X	Company: ATI

ATTACHMENT 1

AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (602) 921-8044 • FAX: (602) 921-0049

Lic. No. AZ0003

LABORATORY REPORT

CLIENT: **Analytical Technologies, Inc.**
9830 S. 51st Street, Suite B-113
Phoenix, AZ 85044

DATE SUBMITTED: 04/03/95
DATE REPORTED: 04/19/95

ATTN: **Mary Tyer**

PO#: ---

SUBMITTED BY: Top Speed Delivery
SAMPLE TYPE: Aqueous
SAMPLE DATE: 03/31/95
METHOD NO.: EPA 405.1

RESULTS

Client Sample I.D.	Analysis Date	AC & T Lab Number	BOD5, mg/L
504300-01	4/3-8/95	L95-1785	305
504300-02	4/3-8/95	L95-1786	329

Reviewed by: Frederick A Amalfi

Frederick A. Amalfi, Ph.D.
Laboratory Director

File No. L95-1785.XLS

AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (602) 921-8044 • FAX: (602) 921-0049

Lic. No. AZ0003

QUALITY CONTROL REPORT

PARAMETER: BOD5
METHOD NO.: 405.1
ANALYSIS DATE: 4/3-4/8/95

UNITS: mg/L
PREPARED BY: CJC

INTERNAL QUALITY CONTROL SAMPLE

Theoretical Value	Analytical Value	% Recovery
198	175	88

DUPLICATE SAMPLE DATA

Lab I.D.	Result 1	Result 2	RPD
L95-1777	<3	<3	0.0
L95-1785	305	311	1.9

SPIKED SAMPLE DATA

Lab I.D.	Sample Result	Spike Result	Amount Spiked	% Recovery
L95-1777	---	---	---	87
L95-1785	---	---	---	102

Ar.. ,ticalTechnologies,Inc.
Phoenix, Arizona

Interlab
Chain of Custody

DATE 4/3/95 PAGE 1 OF

NETWORK PROJECT MANAGER: Mary Tyer

COMPANY: Analytical Technologies, Inc.
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: M. Tyer

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
504300-1	3/3/95	1440	AQ	95-1785																		X									1
-2	↓	↓	↓	95-1786																		X									1

PROJECT INFORMATION	
PROJECT NUMBER:	504300
PROJECT NAME:	GBC
QC LEVEL:	STD. IV
TAT:	STANDARD RUSHI
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: _____
TIME: _____

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Mary Tyer Time: 1035	Signature: R. Tootle Time: 10:50
Printed Name: Mary Tyer Date: 4/3/95	Printed Name: Tootle Date: 4/3/95
Analytical Technologies, Inc. Phoenix	Company: TSD
RECEIVED BY: 1.	**RECEIVED BY: (LAB) 2.**
Signature: R. Tootle Time: 10:35	Signature: Cathy Greer Time: 10:50
Printed Name: Tootle Date: 4/3/95	Printed Name: Greer Date: 4-3-95
Analytical Technologies, Inc. TSD	Company: ACET

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical **Technologies,** Inc. 9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. **506077**

July 14, 1995

Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: Qtr OCD

Attention: Lynn Shelton

On **06/30/95**, Analytical Technologies, Inc., received a request to analyze **aqueous** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Biochemical Oxygen Demand analysis was performed by Aquatic Consulting & Testing, Inc., 1525 W. University Drive, Suite 106, Tempe, AZ 85281 (See Attachment 1).

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Mary H. Tyer

Mary Tyer
Project Manager

MT/jmf

Enclosure

ADHS License No. AZ0061
Elizabeth Proffitt, Laboratory Manager

Analytical Technologies, Inc.

CLIENT : GIANT REFINING
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

DATE RECEIVED : 06/30/95
REPORT DATE : 07/14/95

ATI I.D. : 506077

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	API SEPARATOR	AQUEOUS	06/29/95
02	AER LAG EFF	AQUEOUS	06/29/95

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 506077

CLIENT : GIANT REFINING
PROJECT # : (NONE)
PROJECT NAME : QTR OCD

DATE RECEIVED : 06/30/95
REPORT DATE : 07/14/95

PARAMETER	UNITS	01	02
CHEMICAL OXYGEN DEMAND	MG/L	2800	810

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING
PROJECT # : (NONE)
PROJECT NAME : QTR OCD ATI I.D. : 506077

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHEMICAL OXYGEN DEMAND	MG/L	50602211	340	340	0	630	300	97

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins ▪ Portland ▪ Albuquerque

CHAIN OF CUSTODY

DATE: 6-29-95 PAGE 1 OF 1

ATI LAB I.D. 506077

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING COMPANY
ADDRESS: I40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722-0227
FAX: (505) 722-0210

BILL TO: LYNN SHELTON
COMPANY: GIANT
ADDRESS: RT3 BOX 7
GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	BOD	COD	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API SEPARATOR	6-29	10:15	H_2O	1					X	X																							2
AER LAG EFF	6-29	10:30	H_2O	2					X	X																							2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJ. NO.:		NO. CONTAINERS	4
PROJ. NAME:	QTR OCD	CUSTODY SEALS	Y / N / NA
P.O. NO.:		RECEIVED INTACT	Y
SHIPPED VIA:	FED EX	RECEIVED COLD	BLUE

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☑ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 11:00	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 6-29-95	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Melanie Dianzo Time: 1014
Printed Name: Date:	Printed Name: Date:	Printed Name: Melanie Dianzo Date: 6/30/95
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619) 458-9141 • Phoenix (602) 496-4400 • Seattle (206) 228-8335 • Pensacola (904) 474-1001 • Portland (503) 684-0447 • Albuquerque (505) 344-3777 DISTRIBUTION: White, Canary - ATI • Pink - ORIGINATOR

ATTACHMENT 1

AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (602) 921-8044 • FAX: (602) 921-0049

Lic. No. AZ0003

LABORATORY REPORT

CLIENT: **Analytical Technologies, Inc.**
9830 S. 51st Street, Suite B-113
Phoenix, AZ 85044

DATE SUBMITTED: 06/30/95
DATE REPORTED: 07/12/95

ATTN: **Mary Tyer**

PO#: - - -

SUBMITTED BY: Top Speed Delivery
SAMPLE TYPE: Aqueous
SAMPLE DATE: 06/29/95
METHOD NO.: EPA 405.1

RESULTS

Client Sample I.D.	Analysis Date	AC & T Lab Number	BOD5, mg/L
506077-01	06/30-07/05/95	BA-04036	2030
506077-02	06/30-07/05/95	BA-04037	171

Reviewed by: Frederick A. Amalfi

Frederick A. Amalfi, Ph.D.
Laboratory Director

File No. BA-04036.XLS

AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (602) 921-8044 • FAX: (602) 921-0049

Lic. No. AZ0003

QUALITY CONTROL REPORT

PARAMETER: BOD5
METHOD NO.: 405.1
ANALYSIS DATE: 06/30-07/05/95

UNITS: mg/L
PREPARED BY: CJC

INTERNAL QUALITY CONTROL SAMPLE

Theoretical Value	Analytical Value	% Recovery
198	195	98

DUPLICATE SAMPLE DATA

Lab I.D.	Result 1	Result 2	RPD
BA-04045	132	135	2.2

SPIKED SAMPLE DATA

Lab I.D.	Sample Result	Spike Result	Amount Spiked	% Recovery
BA-04045	---	---	---	104

File No. QC-04045.XLS RB

Analytical Technologies, Inc.
Phoenix, Arizona

Interlab
Chain of Custody

DATE 6/30/95 PAGE 1 OF 1

NETWORK PROJECT MANAGER:

COMPANY: **Analytical Technologies, Inc.**
ADDRESS: 9830 S. 51st Street, Suite B-113
Phoenix, Arizona 85044

CLIENT PROJECT MANAGER: Mary Tyer

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)		632/632 MOD	619/619 MOD			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS	BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE, CO, N2	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
50607701	6/29	MOT 10:15	A	04036																		X									1
50607702	6/29	10:30	↓	04037																		X									1

BA

PROJECT INFORMATION	
PROJECT NUMBER: 506077	
PROJECT NAME: Giant	
QC LEVEL: (STD.) IV	
TAT: (STANDARD) RUSH!	
ATI WORKORDER #	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: _____
TIME: _____

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
AQUATIC	X

RELINQUISHED BY: 1.
Signature: Mary Tyer Time: 1303
Printed Name: Mary Tyer Date 6/30/95
Analytical Technologies, Inc. Phoenix

RELINQUISHED BY: 2.
Signature: M. Tolliver Time: 14:20
Printed Name: M. Tolliver Date 6-30-95
Company: ~~ATI~~ S.

RECEIVED BY: 1.
Signature: M. Tolliver Time: 1303
Printed Name: M. Tolliver Date: 6-30-95
Analytical Technologies, Inc.

RECEIVED BY: (LAB) 2.
Signature: [illegible] Time: 14:20
Printed Name: M Tolliver Date: 6-30-95
Company: ACET

Analytical Technologies, Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. **506442**

July 19, 1995

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: QTR OLD

Attention: Lynn Shelton

On **06/30/95**, Analytical Technologies, Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 150.1 (pH) analyses were performed by Analytical Technologies, Inc., Albuquerque, NM.

All other analyses were performed by Analytical Technologies, Inc., 11 East Olive Road, Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

Analytical Technologies, Inc.

CLIENT	: GIANT REFINING CO.	DATE RECEIVED	: 06/30/95
PROJECT #	: (NONE)		
PROJECT NAME	: QTR OLD	REPORT DATE	: 07/19/95

ATI ID: 506442

	ATI PENSACOLA ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	506442-01	API SEPARATOR	AQUEOUS	06/29/95
02	506442-02	AER LAG EFF	AQUEOUS	06/29/95

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING CO.	ATI I.D.	: 506442
PROJECT #	: (NONE)	DATE RECEIVED	: 06/30/95
PROJECT NAME	: QTR OLD	DATE ANALYZED	: 06/30/95

PARAMETER	UNITS	01	02
PH (150.1)	UNITS	8.61	7.69

Analytical Technologies, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : GIANT REFINING CO. ATI I.D. : 506442

PROJECT # : (NONE) SAMPLE MATRIX : AQUEOUS

PROJECT NAME : QTR OLD

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC.	% REC
PH	UNITS	50644201	8.61	8.59	0.2	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507025
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 506442
Project Name: GIANT REFINING
Project Location: QTR OLD
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 001
Client Sample Id: 506442-01
Sample Date/Time: 29-JUN-95 1015
Received Date: 01-JUL-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	25000	5		TDW052	NSB

Comments:

Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession: 507025
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 506442
Project Name: GIANT REFINING
Project Location: QTR OLD
Test: Group of Single Wetchem
Matrix: WATER
QC Level: II

Lab ID: 002
Client Sample Id: 506442-02

Sample Date/Time: 29-JUN-95 1030
Received Date: 01-JUL-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6700	5		TDW052	NSB

Comments:

Analytical Technologies, Inc.

"Method Report Summary"

Accession Number: 507025
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 506442
Project Name: GIANT REFINING
Project Location: QTR OLD
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
506442-01	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	25000
506442-02	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	6700

Analytical Technologies, Inc.

"WetChem Quality Control Report"

Parameter:	TDS
Batch Id:	TDW052
Blank Result:	<5
Anal. Method:	160.1
Prep. Method:	N/A
Analysis Date:	13-JUL-95
Prep. Date:	12-JUL-95

Sample Duplication

Sample Dup:	507025-1
Rept Limit:	<5
Sample Result:	24760
Dup Result:	25400
Sample RPD:	3
Max RPD:	16
Dry Weight%	N/A

Matrix Spike

Sample Spiked:	N/A
Rept Limit:	N/A
Sample Result:	
Spiked Result:	
Spike Added:	
% Recovery:	
% Rec Limits:	
Dry Weight%	

ICV

ICV Result:	
True Result:	
% Recovery:	
% Rec Limits:	

LCS

LCS Result:	290
True Result:	293
% Recovery:	99
% Rec Limits:	66-122

Analytical Technologies, Inc.

----- Common Footnotes Wet Chem -----

N/A = NOT APPLICABLE.
N/S = NOT SUBMITTED.
N/C = SAMPLE AND DUPLICATE RESULTS ARE AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RPD IS "NOT CALCULABLE" AND NO CONTROL LIMITS APPLY.
ND = NOT DETECTED ABOVE REPORTING LIMIT.
DISS. OR D = DISSOLVED
T & D = TOTAL AND DISSOLVED
R = REACTIVE
T = TOTAL
G = SAMPLE AND/OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE RESULT IS AT OR BELOW ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "IN CONTROL".
Q = THE ANALYTICAL (POST-DIGESTION) SPIKE IS REPORTED DUE TO THE MATRIX (PRE-DIGESTION) SPIKE BEING OUTSIDE ACCEPTANCE LIMITS.
# = ELEVATED REPORTING LIMIT DUE TO INSUFFICIENT SAMPLE.
+ = ELEVATED REPORTING LIMIT DUE TO DILUTION INTO CALIBRATION RANGE.
* = ELEVATED REPORTING LIMIT DUE TO MATRIX INTERFERENCE.
@ = ADJUSTED REPORTING LIMIT DUE TO SAMPLE MATRIX (DILUTION PRIOR TO PREPARATION).
P = ANALYTICAL (POST-DIGESTION) SPIKE
I = DUPLICATE INJECTION
& = AUTOMATED
F = SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
N/C+ = NOT CALCULABLE
N/C* = NOT CALCULABLE; SAMPLE SPIKED > 4 X SPIKE CONCENTRATION.
H = SAMPLE AND/OR DUPLICATE IS BELOW 5 X ATI REPORTING LIMIT AND THE ABSOLUTE DIFFERENCE BETWEEN THE RESULTS EXCEEDS THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL".
A = SAMPLE AND DUPLICATE RESULTS ARE "OUT OF CONTROL".
Z = THE SAMPLE RESULT FOR THE SPIKE IS BELOW REPORTING LIMIT. HOWEVER, THIS RESULT IS REPORTED FOR ACCURATE QC CALCULATIONS.
NH= SAMPLE AND / OR DUPLICATE RESULT IS BELOW 5 X ATI REPORTING LIMIT AND THE RESULTS EXCEED THE ATI REPORTING LIMIT; THEREFORE, THE RESULTS ARE "OUT OF CONTROL" SAMPLE IS NON-HOMOGENOUS.
(*) = DETECTION LIMITS RAISED DUE TO CLP METHOD NOT REQUIRING A CONCENTRATION STEP FOR CN.

(CA) = SEE CORRECTIVE ACTIONS FORM.

SW-846, 3RD EDITION, SEPTEMBER 1986 AND REVISION 1, JULY 1992.
EPA 600/4-79-020, REVISED MARCH 1983.
STANDARD METHODS, 17TH ED., 1989
NIOSH MANUAL OF ANALYTICAL METHODS, 3RD EDITION.
ANNUAL BOOK OF ASTM STANDARDS, VOLUME 11.01, 1991.

1. COLIFORM. COLIFORM PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE LOGARITHM OF COLONIES PER 100 MLS OF SAMPLE ON DUPLICATE PLATES.

2. PH. PH PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND THE DUPLICATE ANALYSIS.

3. FLASHPOINT. FLASHPOINT PRECISION IS MEASURED BY THE ABSOLUTE DIFFERENCE BETWEEN THE SAMPLE AND DUPLICATE ANALYSIS. IF FLASHPOINT IS LESS THAN 25 DEGREES CELSIUS, THE DETECTION LIMIT BECOMES THE INITIAL STARTING TEMPERATURE.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION).

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

DPH = DOLLY P. HWANG	RB = REBECCA BROWN	CD = CHRISTY DRAPER
DBH = DONALD B. HAND	BF = BLANCA FACH	SL = STEPHANIE LOWRY
TT = TONY TINEO	NB = NANCY L. BRASCH	FB = FREDDIE BROWN
JHS = JOSEPH SAUNDERS	MM = MARY MOLONEY	
NSB = NANCY S. BUTLER	CF = CHRISTINE FOSTER	

Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	507025
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	506442
Project Name:	GIANT REFINING
Project Location:	QTR OLD
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	001	Sample Date/Time:	29-JUN-95 1015
Client Sample Id:	506442-01	Received Date:	01-JUL-95
Batch: TOW040		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	13-JUL-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	510	10	
ANALYST	INITIALS	KW		

Comments:

Analytical Technologies, Inc.

"FINAL REPORT FORMAT - SINGLE"

Accession:	507025
Client:	ANALYTICAL TECHNOLOGIES, INC.
Project Number:	506442
Project Name:	GIANT REFINING
Project Location:	QTR OLD
Test:	TOTAL ORGANIC CARBON
Analysis Method:	415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method:	N/A
Matrix:	WATER
QC Level:	II

Lab Id:	002	Sample Date/Time:	29-JUN-95 1030
Client Sample Id:	506442-02	Received Date:	01-JUL-95
Batch: TOW040		Extraction Date:	N/A
Blank: A	Dry Weight %: N/A	Analysis Date:	13-JUL-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL ORGANIC CARBON	MG/L	40	10	
ANALYST	INITIALS	KW		

Comments:

Analytical Technologies, Inc.

"Method Report Summary"

Accession Number: 507025
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 506442
Project Name: GIANT REFINING
Project Location: QTR OLD
Test: TOTAL ORGANIC CARBON

Client Sample Id:	Parameter:	Unit:	Result:
506442-01	TOTAL ORGANIC CARBON	MG/L	510
506442-02	TOTAL ORGANIC CARBON	MG/L	40

Analytical Technologies, Inc.

"QC Report"

Title: Water Blank
Batch: TOW040
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Blank Id: A Date Analyzed: 13-JUL-95 Date Extracted: N/A

Parameters:	Units:	Results:	Reporting Limits:
TOTAL ORGANIC CARBON	MG/L	ND	1
ANALYST	INITIALS	KW	

Comments:

Analytical Technologies, Inc.

"QC Report"

Title: Water Reagent
Batch: TOW040
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

RS Date Analyzed: 13-JUL-95
RSD Date Analyzed: 13-JUL-95

RS Date Extracted: N/A
RSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	RS Conc	RS %Rec	RSD Conc	RSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	6.7	<1	6.3	94	6.6	99	5	30	71-127

Surrogates:

Comments:

Notes:
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT
MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

Analytical Technologies, Inc.

"QC Report"

Title: Water Matrix
Batch: TOW040
Analysis Method: 415.1 / EPA 600 / 04-79-020, Rev. March 1983
Extraction Method: N/A

Dry Weight %: N/A
Sample Spiked: 507136-3

MS Date Analyzed: 13-JUL-95
MSD Date Analyzed: 13-JUL-95

MS Date Extracted: N/A
MSD Date Extracted: N/A

Parameters:	Spike Added	Sample Conc	MS Conc	MS %Rec	MSD Conc	MSD %Rec	RPD	RPD Lmts	Rec Lmts
TOC	6.7	<1	6.8	101	6.7	100	1	30	51-135

Surrogates:

Comments:

Notes:
N/S = NOT SUBMITTED N/A = NOT APPLICABLE D = DILUTED OUT
MG/L = PARTS PER MILLION. < = LESS THAN REPORTING LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS.
SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

Common notation for Organic reporting

Analytical Technologies, Inc.

N/S = NOT SUBMITTED
N/A = NOT APPLICABLE
D = DILUTED OUT
UG = MICROGRAMS
UG/L = PARTS PER BILLION.
UG/KG = PARTS PER BILLION.
MG/M3 = MILLIGRAM PER CUBIC METER.
PPMV = PART PER MILLION BY VOLUME.
MG/KG = PARTS PER MILLION.
MG/L = PARTS PER MILLION.
< = LESS THAN DETECTION LIMIT.
* = VALUES OUTSIDE OF QUALITY CONTROL LIMITS

SOURCES FOR CONTROL LIMITS ARE INTERNAL LABORATORY QUALITY ASSURANCE PROGRAM AND REFERENCED METHOD.

ORGANIC SOILS ARE REPORTED ON A DRYWEIGHT BASIS.

ND = NOT DETECTED ABOVE REPORTING LIMIT.

RPT LIMIT = REPORTING LIMITS BASED ON METHOD DETECTION LIMIT STUDIES.

RPD = RELATIVE PERCENT DIFFERENCE (OR DEVIATION)

ATI/GC/FID
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME IONIZATION DETECTOR (FID).

ATI/GC/FIX
ATI GAS CHROMATOGRAPHIC METHOD FOR ANALYSIS OF FIXED GASES EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD) AND FLAME IONIZATION DETECTOR (FID).

ATI/GC/FPD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH FLAME PHOTOMETRIC DETECTOR (FPD) IN SULFUR-SPECIFIC MODE.

ATI/GC/PID
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH PHOTOIONIZATION DETECTOR (PID).

ATI/GC/TCD
ATI GAS CHROMATOGRAPHIC METHOD EMPLOYING DIRECT INJECTION ON COLUMN WITH THERMAL CONDUCTIVITY DETECTOR (TCD).

LJT = LISA THOMASON
KW = KAREN WADSWORTH
SW = STEVE WILHITE
SJF = STEVE FILOROMO
PL = PAUL LESCHENSKY
RW = ROBERT WOLFE
BV = BEN VAUGHN
KS = KENDALL SMITH
KK = KERRY KUST
STG = SCOTT T. GRESHAM

AnalyticalTechnologies,Inc., Albuquerque, NM
San Diego ▪ Phoenix ▪ Seattle ▪ Pensacola ▪ Ft. Collins ▪ Portland ▪ Albuquerque

CHAIN OF CUSTODY

DATE: 6-29-95 PAGE 1 OF 1

ATI LAB I.D. 506442

PLEASE FILL THIS FORM IN COMPLETELY. SHADED AREAS ARE FOR LAB USE ONLY.

PROJECT MANAGER:

COMPANY: GIANT REFINING COMPANY
ADDRESS: I40 EXIT 39
JAMESTOWN, NM 87347
PHONE: (505) 722 0227
FAX: (505) 722 0210

BILL TO: LYNN SHELTON
COMPANY: GIANT
ADDRESS: RT3 BOX 7
GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE/MTBE (MOD 8015/8020)	BTXE/MTBE (8020)	pH, TOC, TDS		Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	SDWA Volatiles (502.1/503.1), 502.2 Reg. & Unreg.			Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)			SDWA Primary Standards - Arizona	SDWA Secondary Standards - Arizona	SDWA Primary Standards - Federal	SDWA Secondary Standards - Federal			The 13 Priority Pollutant Metals	RCRA Metals by Total Digestion	RCRA Metals by TCLP (1311)		NUMBER OF CONTAINERS
API SEPARATOR	6-29	10:15	H_2O	01					X																								4
AER LAG EFF	6-29	10:30	H_2O	02					X																								4

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJ. NO.:	NO. CONTAINERS	8
PROJ. NAME: QTR OCD	CUSTODY SEALS	Y N NA
P.O. NO.:	RECEIVED INTACT	Y
SHIPPED VIA: FED EX	RECEIVED COLD	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

Comments:

SAMPLED & RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Lynn Shelton Time: 11:00	Signature: Time:	Signature: Time:
Printed Name: LYNN SHELTON Date: 6-29-95	Printed Name: Date:	Printed Name: Date:
Company: GIANT Phone: 722 0227	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: 6/29/95 13:45
Printed Name: Date:	Printed Name: Date:	Printed Name: G. Froehlich Date: 6/29/95
Company:	Company:	Analytical Technologies, Inc.

Analytical**Technologies,**Inc. Albuquerque, NM

Chain of Custody

DATE 6/30 PAGE 1 OF 1

NETWORK PROJECT MANAGER: ~~LETITIA KRAKOWSKI~~ Kim McNeill

COMPANY: **Analytical Technologies, Inc.**

ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: KMNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	TOX	TOC	ORGANIC LEAD	SULFIDE	SURFACTANTS (MBAS)	TDS	632/632 MOD	619/619 MOD	610/8310			8240 (TCLP 1311) ZHE		Diesel/Gasoline/BTXE/MTBE/ (MOD 8015/8020)	Volatile Organics GC/MS (624/8240)		NACE	ASBESTOS		BOD	TOTAL COLIFORM	FECAL COLIFORM		GROSS ALPHA/BETA	RADIUM 226/228		AIR - O2, CO2, METHANE	AIR/Diesel/Gasoline/BTXE/ (MOD 8015/8020)	NUMBER OF CONTAINERS
506442 -01	6/29/95	10:15	AQ	1		X				X																								
-02	6/29/95	10:30	AQ	2		X				X																								

PROJECT INFORMATION	
PROJECT NUMBER:	506442
PROJECT NAME:	QTR OLD
QC LEVEL:	(STD.) IV
QC REQUIRED:	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	6
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	507025

DUE DATE: 7/17 verbal
RUSH SURCHARGE: Ø
CLIENT DISCOUNT: QUOTE %

TWO #
LK545

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	X
PORTLAND	
PHOENIX	
FIBERQUANT	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: KMNeill Time: 4:15	Signature: Time:
Printed Name: KMNeill Date 6/30	Printed Name: Date
Analytical Technologies, Inc. Albuquerque	Company:
RECEIVED BY: (LAB) 1.	**RECEIVED BY: (LAB) 2.**
Signature: Robt Elsperman Time: 0923	Signature: Time:
Printed Name: R. ELSPERMAN Date: 7/1/95	Printed Name: Date:
Company: ATI - FL	Company:

Analytical **Technologies,** Inc.

Albuquerque Office: 2709-D Pan American Fwy., N E
Albuquerque, NM 87107
(505) 344-3777

Remit To:
Analytical Technologies, Inc.
P. O. Box 840436
Dallas, Texas 75284-0436

ORIGINAL
INVOICE
AL 74100

Billed to: GIANT REFINING
ROUTE 3, BOX 7
GALLUP, NM 87301

Accession No.: 9506-442
Date: 07/19/95
Client No.: 341-127
810

Attention: ACCOUNTS PAYABLE

Telephone: 505-722-0227

Authorized by: LYNN SHELTON

P.O. Number:

Samples: 2 received 06/30/95

Project: QTR OLD
Project No.:

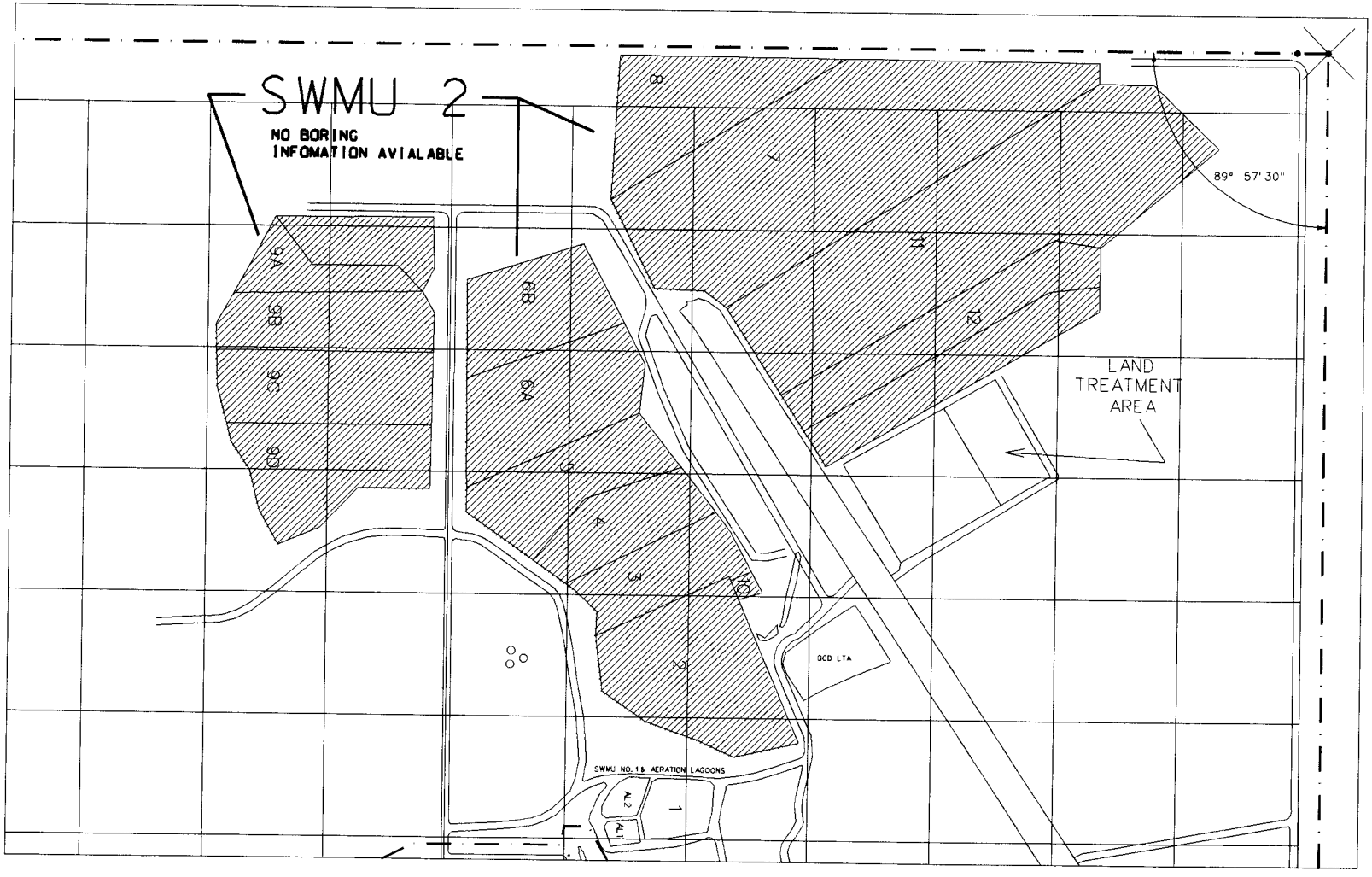
TEST DESCRIPTION	QUANTITY	PRICE	TOTAL
pH	2	6.00	12.00
Total Dissolved Solids	2	10.00	20.00
Total Organic Carbon	2	55.00	110.00
NM GROSS RECEIPTS TAX	1	8.25	8.25
		**********	
		Amount due:	150.25
		**********	

TERMS: Net 30 Days - 1½% Finance Charge on Balance Due over 30 days.

ATI-003

DISTRIBUTION: White-Customer, Yellow-File, Pink-Accounting

GIANT REFINING
CINIZA REFINERY
SWMU 2
EVAPORATION PONDS



American Environmental Network, Inc.

mw 4

AEN I.D. 805333

June 2, 1998

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name (none)
Project Number (none)

Attention: STEVE MORRIS

On 5/8/98 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 150.1 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

All other parameters were performed by American Environmental Network (CT) Inc., Monroe, CT.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: 5-5-98 PAGE: 1 OF 1

[redacted]

SHADED AREAS ARE FOR AEN USE ONLY

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3 Box 7
Gallup, NM 87301
PHONE: 505 722 3833
FAX: 505 722 0210

BILL TO: Giant Refining Co./Ciniza
COMPANY: SA HE
ADDRESS:

ANALYSIS REQUESTED

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry: See Attached	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	LAB USE ONLY
MW-1-5598	5/5/98	0900	Water	[redacted]											X	X							X						[redacted]
MW-2-5598	5/5/98	1020	"	[redacted]											X	X							X						[redacted]
MW-5-5598	5/5/98	1130	"	[redacted]											X	X							X						[redacted]
MW-4-5598	5/5/98	1430	"	[redacted]											X	X							X						[redacted]
OW-11-5598	5/5/98	1530	"	[redacted]											X	X							X						[redacted]
Trip Blank	4/4/98	1100	AQ	[redacted]											X	X													[redacted]
				[redacted]																									[redacted]
				[redacted]																									[redacted]
				[redacted]																									[redacted]
				[redacted]																									[redacted]

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT INFORMATION	PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS	RELINQUISHED BY:	RELINQUISHED BY:
PROJ. NO.:	(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒	Signature: Steve Morris Time: 10:00	Signature: Time:
PROJ. NAME:	CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER	Printed Name: Steve Morris Date: 5-2-98	Printed Name: Date:
P.O. NO.:	METHANOL PRESERVATION ☐	Company: Giant	Company:
SHIPPED VIA:	COMMENTS: FIXED FEE ☐	RECEIVED BY:	RECEIVED BY:
SAMPLE RECEIPT	Annual Groundwater Event 1998	Signature: Time:	[redacted]
[redacted]		Printed Name: Date:	[redacted]
[redacted]		Company:	[redacted]

ANNUAL GROUNDWATER SAMPLING EVENT

ANALYTICAL PARAMETERS

WELL	pH	Cond	TOC*	TOX*	TDS	ALKAL BICARB	ALKAL CARB	CHLORIDE	SULFATE	PHENOL	VOL-ORG 8260	BTEX 8260	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
MW-1	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
OW-1	X	X			X	X	X	X	X			X							X	X		X			X
OW-2	X	X			X	X	X	X	X			X							X	X		X			X
OW-3	X	X			X	X	X	X	X			X							X	X		X			X
OW-12												X													
OW-29												X													
OW-30												X													

* TOC - 2 replicates & original

* TOX - 3 replicates & original

AMERICAN ENVIRONMENTAL NETWORK
Albuquerque, New Mexico

Interlab Chain of Custody

DATE: 5/8/98 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: AMERICAN ENVIRONMENTAL NETWORK
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

7098-1044A

CLIENT PROJECT MANAGER:

Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	~~Metals - RCRA~~ ** K, Se, Ag, Na	RCRA Metals by TCLP (1311)	X Cr, Pb, Hg	** As, Ba, Cd, Cr, Mg, Mn	TOX	TOC	Gen Chemistry	X EC, TDS, Cl, SO4	Alkalinity (Carb/Bicarb)	Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)	X Phenolics	TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
805333-01	5/5/98	0900	AQ	01			X		X	X	X	X		X	X											X						
-02		1020		02			X		X	X	X	X		X	X											X						
-03		1130		03			X		X	X	X	X		X	X											X						
-04		1430		04			X		X	X	X	X		X	X											X						
-05		1530		05			X		X	X	X	X		X	X											X						

Passed Rad Screen
DC 5/11/98 50

PROJECT INFORMATION	
PROJECT NUMBER:	805333
PROJECT NAME:	Giant Refining Co.
QC LEVEL:	STD IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 5/22 – 5/29
RUSH SURCHARGE:
CLIENT DISCOUNT:
SPECIAL CERTIFICATION REQUIRED: ☐ YES ☐ NO

SAMPLES SENT TO:	
CONNECTICUT	X
ILLINOIS	
MASSACHUSETTS	
PENSACOLA	
PORTLAND	
PHOENIX	
N.CAROLINA	

RELINQUISHED BY: 1.
Signature: [signature] Time: 1700
Printed Name: John Caldwell Date: 5/8/98
Albuquerque

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB) 2.
Signature: [signature] Time: 0900
Printed Name: [signature] Date: 5/11/98
Company: AEN CT

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805333
PROJECT #	: (none)	DATE RECEIVED	: 5/8/98
PROJECT NAME	: (none)	REPORT DATE	: 6/2/98

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-1-5598	AQUEOUS	5/5/98
02	MW-2-5598	AQUEOUS	5/5/98
03	MW-5-5598	AQUEOUS	5/5/98
04	MW-4-5598	AQUEOUS	5/5/98
05	OW-11-5598	AQUEOUS	5/5/98
06	TRIP BLANK	AQUEOUS	4/6/98

7098-1044A
AEN-NEW MEXICO

Case Narrative

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered.

Analyte	Method	Reference
Alkalinity	310.1	1
Bicarbonate	2320B	2
Carbonate	2320B	2
Conductivity	120.1	1
Chloride	325.2	1
Phenols	420.2	1
pH	150.1	1
Sulfate	375.2	1
TDS	160.1	1
Temperature	2550B	1
TOCD	9060	3
TOXD	9020	3

References:

1. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.
2. Standard Methods for the Examination of Water and Wastewater. 18th edition, 1992.
3. Test Methods for the Evaluation of Solid Waste, SW846, 3rd edition, 1986.

Metals - ICAP metals were determined using a JA61E trace ICAP using guidance provided in SW846 according to the following methods: ICAP-3010/6010.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

IEC's are electronically employed by the JA61E trace ICAP. However, the ICSA is utilized as a monitoring device to detect any additional adjustments that may be required. These modifications are calculated and applied manually. They are so noted in the raw data.

American Environmental Network, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805333
PROJECT #	: (none)	DATE RECEIVED	: 5/8/98
PROJECT NAME	: (none)		

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE ANALYZED
04	MW-4-5598	AQUEOUS	5/5/98	5/12/98
05	OW-11-5598	AQUEOUS	5/5/98	5/12/98

PARAMETER	UNITS	04	05
PH (150.1)	UNITS	8.78	8.43

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805333
PROJECT #	: (none)	DATE RECEIVED :	5/8/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805333-04	MW-4-5598	AQUEOUS	5/5/98	N/A	05/11/98	1

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805333
PROJECT #	: (none)	DATE RECEIVED :	5/8/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805333-04	MW-4-5598	AQUEOUS	5/5/98	N/A	05/11/98	1

PARAMETER	DET. LIMIT		UNITS
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L
Styrene	1.0	< 1.0	ug/L
Bromoform	1.0	< 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L
1,2,3-Trichloropropane	1.0	< 1.0	ug/L
Isopropyl Benzene	1.0	< 1.0	ug/L
Bromobenzene	1.0	< 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L
n-Propylbenzene	1.0	< 1.0	ug/L
2-Chlorotoluene	1.0	< 1.0	ug/L
4-Chlorotoluene	1.0	< 1.0	ug/L
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L
tert-Butylbenzene	1.0	< 1.0	ug/L
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L
sec-Butylbenzene	1.0	< 1.0	ug/L
1,3-Dichlorobenzene	1.0	< 1.0	ug/L
1,4-Dichlorobenzene	1.0	< 1.0	ug/L
p-Isopropyltoluene	1.0	< 1.0	ug/L
1,2-Dichlorobenzene	1.0	< 1.0	ug/L
n-Butylbenzene	1.0	< 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L
Naphthalene	1.0	< 1.0	ug/L
Hexachlorobutadiene	1.0	< 1.0	ug/L
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	104 (80 - 120)
Toluene-d8	104 (88 - 110)
Bromofluorobenzene	98 (86 - 115)

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

MW-4-5598

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 1044A SAS No. : _____ SDG No.: A1044

Matrix: (soil/water) WATER Lab Sample ID: 1044004

% Solids: _____ Date Received: 05/11/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	450.			
BICARB	433.			
CARBONATE	16.2			
CHLORIDE	18.3			
CONDUCT	1190.			
PH	8.62			
PHENOLS	0.014			
SULFATE	169.			
TDS	700.			
TEMPERATUR	18.0			
TOCD	2.95			
TOXD	10.00	U		

Comments: _____

Aqueous

TABLE AS-1.0
7098-1044A
AEN-NEW MEXICO
MISCELLANEOUS ATOMIC SPECTROSCOPY (Dissolved)

All values are ug/L.

Client Sample I.D.	MW-1-5598	MW-2-5598	MW-5-5598	MW-4-5598
Lab Sample I.D.	981044A-01	981044A-02	981044A-03	981044A-04
Arsenic	10.0U	10.0U	10.0U	10.0U
Barium	200.U	200.U	200.U	200.U
Cadmium	5.0U	5.0U	5.0U	5.0U
Calcium	5000U	5000U	5000U	5000U
Chromium	NR	NR	NR	NR
Lead	NR	NR	NR	NR
Magnesium	5000U	5000U	5000U	5000U
Manganese	15.0U	15.0U	15.0U	15.0U
Mercury	NR	NR	NR	NR
Potassium	5000U	5000U	5000U	5000U
Selenium	5.0U	5.0U	5.0U	5.0U
Silver	10.0U	10.0U	10.0U	10.0U
Sodium	79200	159000	149000	146000

See Appendix for qualifier definitions

Aqueous

TABLE AS-1.2
7098-1044A
AEN-NEW MEXICO
MISCELLANEOUS ATOMIC SPECTROSCOPY (Total)

All values are ug/L.

Client Sample I.D.	MW-1-5598	MW-2-5598	MW-5-5598	MW-4-5598
Lab Sample I.D.	981044A-01	981044A-02	981044A-03	981044A-04
Arsenic	NR	NR	NR	NR
Barium	NR	NR	NR	NR
Cadmium	NR	NR	NR	NR
Calcium	NR	NR	NR	NR
Chromium	10.0U	10.0U	10.0U	10.0U
Lead	3.0U	3.0U	3.0U	3.0U
Magnesium	NR	NR	NR	NR
Manganese	NR	NR	NR	NR
Mercury	0.20U	0.20U	0.20U	0.20U
Potassium	NR	NR	NR	NR
Selenium	NR	NR	NR	NR
Silver	NR	NR	NR	NR
Sodium	NR	NR	NR	NR

See Appendix for qualifier definitions

INORGANICS APPENDIX

C - Concentration qualifiers

U - Indicates analyte was not detected at method reporting limit.

B - Indicates analyte result between IDL and contract required detection limit (CRDL)

Q - QC qualifiers

E - Reported value is estimated because of the presence of interference

M - Duplicate injection precision not met

N - Spiked sample recovery not within control limits

S - The reported value was determined by the method of standard additions (MSA)

W - Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M - Method codes

P - ICP

A - Flame AA

F - Furnace AA

CV - Cold vapor AA (manual)

C - Cyanide

NR - Not Required

NC - Not Calculated as per protocols

mw-4

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805333
PROJECT #	: (none)	DATE RECEIVED :	5/8/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805333-06	Trip Blank	AQUEOUS	4/6/98	N/A	05/11/98	1

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805333
PROJECT #	: (none)	DATE RECEIVED :	5/8/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805333-06	Trip Blank	AQUEOUS	4/6/98	N/A	05/11/98	1

PARAMETER	DET. LIMIT		UNITS
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L
Styrene	1.0	< 1.0	ug/L
Bromoform	1.0	< 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L
1,2,3-Trichloropropane	1.0	< 1.0	ug/L
Isopropyl Benzene	1.0	< 1.0	ug/L
Bromobenzene	1.0	< 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L
n-Propylbenzene	1.0	< 1.0	ug/L
2-Chlorotoluene	1.0	< 1.0	ug/L
4-Chlorotoluene	1.0	< 1.0	ug/L
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L
tert-Butylbenzene	1.0	< 1.0	ug/L
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L
sec-Butylbenzene	1.0	< 1.0	ug/L
1,3-Dichlorobenzene	1.0	< 1.0	ug/L
1,4-Dichlorobenzene	1.0	< 1.0	ug/L
p-Isopropyltoluene	1.0	< 1.0	ug/L
1,2-Dichlorobenzene	1.0	< 1.0	ug/L
n-Butylbenzene	1.0	< 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L
Naphthalene	1.0	< 1.0	ug/L
Hexachlorobutadiene	1.0	< 1.0	ug/L
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	104 (80 - 120)
Toluene-d8	104 (88 - 110)
Bromofluorobenzene	101 (86 - 115)

American Environmental Network, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805333
PROJECT #	: (none)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: (none)		

PARAMETER	UNITS	AEN I.D.	SAMPLE RESULT	DUP. RESULT	% RPD
PH	UNITS	805333-01	9.04	9.05	0

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

American Environmental Network, Inc.

AEN I.D. 805357

June 12, 1998

OW 1
1998

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name ANNUAL GW SAMPLING
Project Number (none)

Attention: STEVE MORRIS

On 5/15/98 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

This report is being reissued in part to correct the client ID. This report was originally dated 6/10/98. We apologize for any inconvenience this may have caused.

EPA method 150.1 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

All other parameters were performed by American Environmental Network (CT) Inc., Monroe, CT.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: 5-14-98 PAGE: 1 OF 1

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co. / Ciniza
COMPANY: Same
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
OW-1-51398	5/13/98	1930	H_2O	
OW-2-51398	"	1130	"	
OW-3-51398	"	1345	"	

ANALYSIS REQUEST

Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	SEE ATTACHED LIST	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:				
									X																				
									X																				
									X																				

PROJECT INFORMATION

PROJ. NO.: Annual
PROJ. NAME: groundwater
P.O. NO.: sampling
SHIPPED VIA: event 1998

SAMPLE RECEIPT

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐
CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER
METHANOL PRESERVATION ☐
COMMENTS: FIXED FEE ☐

Passed Rad Screen

RELINQUISHED BY

Signature: [signature] Time: 0830
Printed Name: Steve Morris Date: 5/14/98
Company: Giant

RECEIVED BY

Signature: [signature] Time:
Printed Name: P Sequin Date: 5/14/98
Company: AEN/CT

RELINQUISHED BY

Signature: Time:
Printed Name: Date:
Company:

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: 5-14-98 PAGE: 1 OF 1

AEN (NM) Accession #:

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co. / Ciniza
COMPANY: Same
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	SEE ATTACHED LIST	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GCMS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:	CH		Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
OW-1-51398	5/13/98	1930	H_2O	01											X		X								X							
OW-2-51398	"	1130	"	02											X		X								X							
OW-3-51398	"	1345	"	03											X		X								X							

PROJECT INFORMATION	
PROJ. NO.:	Annual
PROJ. NAME:	groundwater
P.O. NO.:	sampling
SHIPPED VIA:	event 1998

SAMPLE RECEIPT	
NO. CONTAINERS	11
CUSTODY SEALS	ON
SEALS INTACT	Y
RECEIVED ON ICE	Y

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) [ ] 24hr [ ] 48hr [ ] 72hr [ ] 1 WEEK (NORMAL) [ ]

CERTIFICATION REQUIRED: [ ] NM [ ] SDWA [ ] OTHER

METHANOL PRESERVATION [ ]

COMMENTS: FIXED FEE [ ]

RELINQUISHED BY: 1	RELINQUISHED BY: 2
Signature: Steve Morris Time: 0830	Signature: Time:
Printed Name: Steve Morris Date: 5/14/98	Printed Name: Date:
Company: Giant	Company:
RECEIVED BY: 1	RECEIVED BY (LAB): 2
Signature: Time:	
Printed Name: Date:	
Company:	

ANALYTICAL PARAMETERS

WELL	pH	Cond	TOC*	TOX*	TDS	ALKAL BICARB	ALKAL CARB	CHLORIDE	SULFATE	PHENOL	VOL-ORG 8260	BTEX 8260	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
MW-1	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
OW-1	X	X			X	X	X	X	X			X							X	X		X			X
OW-2	X	X			X	X	X	X	X			X							X	X		X			X
OW-3	X	X			X	X	X	X	X			X							X	X		X			X
OW-12												X													
OW-29												X													
OW-30												X													

* TOC - 2 replicates & original
* TOX - 3 replicates & original

AMERICAN ENVIRONMENTAL NETWORK
Albuquerque, New Mexico

Interlab Chain of Custody

DATE: 5/15 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: AMERICAN ENVIRONMENTAL NETWORK
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

7098-1103A

CL PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)		TOX	TOC	Gen Chemistry			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
805357-01	5/13/98	1030	AQ	01					X Ca, Mg, K, Na																							
-02		1130	AQ	02					X																							
-03		1345	AQ	03					X																							

Passed Rad Screen
5/16/98

PROJECT INFORMATION

PROJECT NUMBER: 805357
PROJECT NAME: Giant Refining Co.
C LEVEL: STD IV
C REQUIRED: MS MSD BLANK
T: STANDARD RUSHI
E DATE: 5/29-6/5
ISH SURCHARGE:
IENT DISCOUNT:
ECIAL CERTIFICATION REQUIRED: ☐ YES ☐ NO

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

X = Dissolved Metals

Passed Rad Screen

SAMPLES SENT TO:

CONNECTICUT	X
ILLINOIS	
MASSACHUSETTS	
PENSACOLA	
PORTLAND	
PHOENIX	
N.CAROLINA	

RELINQUISHED BY: 1.
Signature: [signature] Time: 1700
Printed Name: John Caldwell Date: 5/15/98
Albuquerque

RECEIVED BY: LAB 1.
Signature: [signature] Time: 10:00
Printed Name: P. SEQUIN Date: 5/16/98
Company: AENV CT

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: ~~(LAB)~~ 2.
Signature: Time:
Printed Name: Date:
Company:

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	DATE RECEIVED	: 5/15/98
PROJECT NAME	: ANNUAL GW SAMPLING	REPORT DATE	: 6/10/98

June 12, 1998

ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-1-51398	AQUEOUS	5/13/98
02	OW-2-51398	AQUEOUS	5/13/98
03	OW-3-51398	AQUEOUS	5/13/98

American Environmental Network
200 Monroe Turnpike • Monroe, CT 06468 • (203) 261-4458 • Fax (203) 268-5346

June 04, 1998

Ms. Kim Mcneill
AEN-NEW MEXICO
2709-D Pan American Freeway, Ne
Albuquerque, NM 87107

Dear Ms. Mcneill :

Please find enclosed the analytical results of 3 sample(s) received at our laboratory on May 16, 1998. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

IEA Report #7098-1103A	Purchase Order #805357
Project ID: 805357	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Cheryl A. Cascella for
Jeffrey C. Curran
Laboratory Manager

JCC

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	DATE RECEIVED	: 05/15/98
PROJECT #	: (NONE)		
PROJECT NAME	: ANNUAL GW SAMPLES	REPORT DATE	: 06/24/98

AEN ID: 805356

	AEN ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	805356-01	OW-1-51398A	AQUEOUS	05/13/98
02	805356-02	OW-2-51398A	AQUEOUS	05/13/98
03	805356-03	OW-3-51398A	AQUEOUS	05/13/98

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	3

AEN STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

7098-1103A
AEN-NEW MEXICO
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
805357-01	981103A-01	WATER	05/13/98	05/16/98
805357-02	981103A-02	WATER	05/13/98	05/16/98
805357-03	981103A-03	WATER	05/13/98	05/16/98

IEA-CT ANALYTICAL SUMMARY

Client ID: 805357-01, 805357-02, 805357-03
Job Number: 7098-1103A

Date: 6/4/98

Qty	Matrix	Analysis	Description
3	WATER	ALK-310.1	Alkalinity
3	WATER	CA-SW846-D	Calcium (Dissolved)
3	WATER	CHLORIDE-325.2	Chloride
3	WATER	COND-120.1	Conductivity
3	WATER	K-SW846-D	Potassium (Dissolved
3	WATER	MET-PREP-ICAP-D	Metals ICAP Prep (Di
3	WATER	MG-SW846-D	Magnesium (Dissolved
3	WATER	NA-SW846-D	Sodium (Dissolved)
3	WATER	SULFATE-375.2	Sulfate
3	WATER	TDS-160.1	Total Dissolved Soli

AEN Connecticut
Internal Chain-of-Custody

Client: AEN NM

AEN Job #: 2098-1103A

Custody Seal: present / absent
intact / not intact

Airbill #: FE

Sample #s: 01-03

Field C-O-C present / absent

Locations: 3, 6

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1-3	[illegible]	R Guerrero	5/19	17:30	Alkal	R Guerrero	[illegible]	5/19	23:00
1-3	[illegible]	[illegible]	5/21	1345	CHCOCIPE	M. Bourgeau	[illegible]	5/27/98	14:45
1-3	[illegible]	[illegible]	5/28	1200	cunhut	SSM	[illegible]	5/29	21:30

AS:022189:0

an environmental testing company
200 Monroe Turnpike
Monroe, Connecticut 06468
(203) 261-4458
FAX (203) 268-5346

CHAIN OF CUSTODY
ATOMIC SPECTROSCOPY DEPARTMENT

Job Number 7098-1103A Sample Numbers 01-03

WATER - SOIL - SLUDGE - EPTOX/TCLP

I confirm that I have performed the preparation below following SOP guidelines and authorize the release of this preparation:

Sample Prep

	05/26/98	ICP/FLME
		FURN
Chemist	Date(s)	MERCURY

I confirm that I have performed the analysis below following SOP guidelines and authorize the release of all associated data:

Analysis

	05/28/98	ICP
		FLAME
		FURN
Chemist	Date(s)	MERCURY

I have reviewed and authorize the release of this job:

Complete

Supervisor — Date 5/29/98

Batch Assignment

American Environmental Network, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	DATE RECEIVED	: 5/15/98
PROJECT NAME	: ANNUAL GW SAMPLING		

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE ANALYZED
01	OW-1-51398	AQUEOUS	5/13/98	5/29/98
02	OW-2-51398	AQUEOUS	5/13/98	5/29/98
03	OW-3-51398	AQUEOUS	5/13/98	5/29/98

PARAMETER	UNITS	01	02	03
PH (150.1)	UNITS	8.82	7.95	7.95

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)	DATE RECEIVED :	5/15/98
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805357-01	OW-1-51398	AQUEOUS	5/13/98	N/A	05/19/98	1

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)	DATE RECEIVED :	5/15/98
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805357-01	OW-1-51398	AQUEOUS	5/13/98	N/A	05/19/98	1

PARAMETER	DET. LIMIT		UNITS
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L
Styrene	1.0	< 1.0	ug/L
Bromoform	1.0	< 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L
1,2,3-Trichloropropane	1.0	< 1.0	ug/L
Isopropyl Benzene	1.0	< 1.0	ug/L
Bromobenzene	1.0	< 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L
n-Propylbenzene	1.0	< 1.0	ug/L
2-Chlorotoluene	1.0	< 1.0	ug/L
4-Chlorotoluene	1.0	< 1.0	ug/L
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L
tert-Butylbenzene	1.0	< 1.0	ug/L
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L
sec-Butylbenzene	1.0	< 1.0	ug/L
1,3-Dichlorobenzene	1.0	< 1.0	ug/L
1,4-Dichlorobenzene	1.0	< 1.0	ug/L
p-Isopropyltoluene	1.0	< 1.0	ug/L
1,2-Dichlorobenzene	1.0	< 1.0	ug/L
n-Butylbenzene	1.0	< 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L
Naphthalene	1.0	< 1.0	ug/L
Hexachlorobutadiene	1.0	< 1.0	ug/L
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	106 (80 - 120)
Toluene-d8	104 (88 - 110)
Bromofluorobenzene	100 (86 - 115)

7098-1103A
AEN/NEW MEXICO

Case Narrative

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered.

Analyte	Method	Reference
Alkalinity	310.1	1
Chloride	325.2	1
Conductivity	120.1	1
Sulfate	375.2	1
TDS	160.1	1

References:

1. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.

Metals - ICAP metals were determined using a JA61E trace ICAP using guidance provided in SW846 according to the following methods: ICAP-3010/6010.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

IEC's are electronically employed by the JA61E trace ICAP. However, the ICSA is utilized as a monitoring device to detect any additional adjustments that may be required. These modifications are calculated and applied manually. They are so noted in the raw data.

Alkalinity
Bicarbonate/Carbonate

	Total Alkalinity ppm	Bicarb. ppm	Carbonate ppm
OW-1-51398	408	392.07	15.72
OW-2-51398	667	662.56	4.41
OW-3-51398	650	645.77	4.20

TABLE AS-1.0
7098-1103A
AEN-NEW MEXICO
MISCELLANEOUS ATOMIC SPECTROSCOPY

Aqueou

All values are ug/L.

Client Sample I.D.	OW-1-51398	OW-2-51398	OW-3-51398	
Lab Sample I.D.	805357-01	805357-02	805357-03	
	981103A-01	981103A-02	981103A-03	
Calcium	5000U	9770	10100	
Magnesium	5000U	5000U	5000U	
Potassium	5000U	5000U	5000U	
Sodium	174000	170000	166000	

See Appendix for qualifier definitions

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

805357-01 OW-1-51398

Lab Name: IEA

Contract: _____

Lab Code: IEA Case No.: 1103A SAS No. : _____ SDG No.: A1103

Matrix: (soil/water) WATER

Lab Sample ID: 1103001

% Solids: _____

Date Received: 05/16/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	408.			
CHLORIDE	48.2			
CONDUCT	1340.			
SULFATE	229.			
TDS	795.			

mments:

FORM I - WC

INORGANICS APPENDIX

C - Concentration qualifiers

U - Indicates analyte was not detected at method reporting limit.

B - Indicates analyte result between IDL and contract required detection limit (CRDL)

Q - QC qualifiers

E - Reported value is estimated because of the presence of interference

M - Duplicate injection precision not met

N - Spiked sample recovery not within control limits

S - The reported value was determined by the method of standard additions (MSA)

W - Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M - Method codes

P - ICP

A - Flame AA

F - Furnace AA

CV - Cold vapor AA (manual)

C - Cyanide

NR - Not Required

NC - Not Calculated as per protocols

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)		
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT 1998		

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	051898	AQUEOUS	N/A	05/18/98	1

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)		
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT 1998		

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	051898	AQUEOUS	N/A	05/18/98	1

PARAMETER	DET. LIMIT		UNITS
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L
Styrene	1.0	< 1.0	ug/L
Bromoform	1.0	< 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L
1,2,3-Trichloropropane	1.0	< 1.0	ug/L
Isopropyl Benzene	1.0	< 1.0	ug/L
Bromobenzene	1.0	< 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L
n-Propylbenzene	1.0	< 1.0	ug/L
2-Chlorotoluene	1.0	< 1.0	ug/L
4-Chlorotoluene	1.0	< 1.0	ug/L
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L
tert-Butylbenzene	1.0	< 1.0	ug/L
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L
sec-Butylbenzene	1.0	< 1.0	ug/L
1,3-Dichlorobenzene	1.0	< 1.0	ug/L
1,4-Dichlorobenzene	1.0	< 1.0	ug/L
p-Isopropyltoluene	1.0	< 1.0	ug/L
1,2-Dichlorobenzene	1.0	< 1.0	ug/L
n-Butylbenzene	1.0	< 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L
Naphthalene	1.0	< 1.0	ug/L
Hexachlorobutadiene	1.0	< 1.0	ug/L
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	100 (80 - 120)
Toluene-d8	99 (88 - 110)
Bromofluorobenzene	93 (86 - 115)

American Environmental Network, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: ANNUAL GW SAMPLING		

PARAMETER	UNITS	AEN I.D.	SAMPLE RESULT	DUP. RESULT	% RPD
PH	UNITS	805357-01	8.82	8.68	2

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

U.S. EPA - CLP

3
BLANKS

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: _____ SAS No.: _____ SDG No.: A1103

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Calcium									5000.000	U	P
Magnesium									5000.000	U	P
Potassium									5000.000	U	P
Sodium									5000.000	U	P

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

007S

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 1103 SAS No.: _____ SDG No.: A1103

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Calcium		143413.6000		124048.9000		20000.00	96.8		P
Magnesium	75-125	37520.7900		17036.8400		20000.00	102.4		P
Potassium	75-125	28601.9500		6136.4570		20000.00	112.3		P
Sodium	75-125	74846.1200		56376.0200		20000.00	92.4		P

Comments:

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

007D

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 1103 SAS No.: _____ SDG No.: A1103

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Calcium		124048.9000		125514.8000		1.2		P
Magnesium	.0	17036.8400		17120.2100		0.5		P
Potassium	.0	6136.4570		6137.9810				P
Sodium		56376.0200		58248.3000		3.3		P

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: _____ SAS No.: _____ SDG No.: A1103

Solid LCS Source: _____

Aqueous LCS Source: INORG. VENT.

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Calcium	20000.0	21215.26	106.1						
Magnesium	20000.0	20593.30	103.0						
Potassium	20000.0	17405.09	87.0						
Sodium	20000.0	19527.61	97.6						

IEA

CLASSICAL CHEMISTRY
QUALITY CONTROL SUMMARY REPORT

JOB # : 3098-1103A
CLIENT : IEA / CT

UNITS : mg/L

ANALYTE	SAMPLE ID	SAMPLE RESULT	DUPLICATE RESULT	RPD	SPIKE RESULT	SPIKE ADDED	% RECOVERY	METHOD BLANK
ALKALIN	1103A-01	408	406	0.49	NA			<2.0
CHLORIDE	1033A-01	39.15	39.12	0.18	94.87	60.0	92.9	<3.0
CONDUCT	1090A-01	1422	1434	0.84	NA			0.38
SULFATE	1033A-01	123	122	0.82	142.2	30.0	64.0	<10.0
TDS	1162A-04	507	511	0.79	NA			<10.0

American Environmental Network, Inc.

Spike Recovery and RPD Summary Report - WATER

Method : C:\HPCHEM\1\METHODS\82600310.M (RTE Integrator)
Title : AEN New Mexico GC/MS
Last Update : Tue May 12 14:39:09 1998
Response via : Initial Calibration

Non-Spiked Sample: 05199801.D

	Spike Sample	Spike Duplicate Sample
File ID :	051898S3.D	051898S4.D
Sample :	805357-01 MS	805357-01 MSD
Acq Time:	18 May 98 7:47 pm	18 May 98 8:25 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-Dichloroethene	0.0	50	51	49	101	99	2	14	61-145
Benzene	0.0	50	52	51	103	102	1	11	76-127
Trichloroethene	0.0	50	50	49	99	98	1	14	71-120
Toluene	0.0	50	50	49	100	98	2	13	76-125
Chlorobenzene	0.0	50	49	48	98	95	3	13	75-130

- Fails Limit Check

82600310.M Tue May 19 14:35:01 1998

American Environmental Network, Inc.

AEN I.D. 805356

June 24, 1998

Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: ANNUAL GW SAMPLES

Attention: Steve Morris

On **05/15/98**, American Environmental Network (NM) Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All analyses were performed by American Environmental Network (CT), Inc., Monroe, CT.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
General Manager

MR:jt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network
200 Monroe Turnpike • Monroe, CT 06468 • (203) 261-4458 • Fax (203) 268-5346

June 23, 1998

Ms. Kim Mcneill
AEN-NEW MEXICO
2709-D Pan American Freeway, Ne
Albuquerque, NM 87107

Dear Ms. Mcneill :

Please find enclosed the analytical results of 3 sample(s) received at our laboratory on May 16, 1998. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

IEA Report #7098-1102A	Purchase Order #805356
Project ID: 805356	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Charlene Cassella for

Jeffrey C. Curran
Laboratory Manager

JCC

7098-1102A
AEN/NEW MEXICO

Case Narrative

Semi-Volatile Organics - Semi-volatile organic samples were extracted and analyzed by capillary GC/MS using guidance provided in Methods 3510B/8270B. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

All samples were extracted, concentrated and analyzed without any apparent problems.

TABLE SV-1.0
7098-1102A
AEN-NEW MEXICO
TCL SEMI-VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	OW-1-51398A 805356-01	OW-2-51398A 805356-02	Quant. Limits with no Dilution
Lab Sample I.D.	SBLKYI	981102A-01	981102A-02	
Method Blank I.D.	SBLKYI	SBLKYI	SBLKYI	
Quant. Factor	1.00	1.05	1.04	
Phenol	U	U	U	10
bis(2-Chloroethyl)ether	U	U	U	10
2-Chlorophenol	U	U	U	10
1,3-Dichlorobenzene	U	U	U	10
1,4-Dichlorobenzene	U	U	U	10
Benzyl alcohol	U	U	U	10
1,2-Dichlorobenzene	U	U	U	10
2-Methylphenol	U	U	U	10
2,2'-oxybis(1-Chloropropane)	U	U	U	10
4-Methylphenol	U	U	U	10
N-Nitroso-di-n-propylamine	U	U	U	10
Hexachloroethane	U	U	U	10
Nitrobenzene	U	U	U	10
Isophorone	U	U	U	10
2-Nitrophenol	U	U	U	10
2,4-Dimethylphenol	U	U	U	10
Benzoic acid	U	U	U	50
bis(2-Chloroethoxy)methane	U	U	U	10
2,4-Dichlorophenol	U	U	U	10
1,2,4-Trichlorobenzene	U	U	U	10
Naphthalene	U	U	U	10
4-Chloroaniline	U	U	U	10
Hexachlorobutadiene	U	U	U	10
4-Chloro-3-methylphenol	U	U	U	10
2-Methylnaphthalene	U	U	U	10
Hexachlorocyclopentadiene	U	U	U	10
2,4,6-Trichlorophenol	U	U	U	10
2,4,5-Trichlorophenol	U	U	U	50
2-Chloronaphthalene	U	U	U	10
2-Nitroaniline	U	U	U	50
Dimethylphthalate	U	U	U	10
Acenaphthylene	U	U	U	10
2,6-Dinitrotoluene	U	U	U	10
3-Nitroaniline	U	U	U	50
Acenaphthene	U	U	U	10
Date Received		05/16/98	05/16/98	
Date Extracted	05/20/98	05/20/98	05/20/98	
Date Analyzed	05/27/98	05/27/98	05/27/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE SV-1.0
7098-1102A
AEN-NEW MEXICO
TCL SEMI-VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	OW-1-51398A 805356-01	OW-2-51398A 805356-02	Quant. Limits with no Dilution
Lab Sample I.D.	SBLKYI	981102A-01	981102A-02	
Method Blank I.D.	SBLKYI	SBLKYI	SBLKYI	
Quant. Factor	1.00	1.05	1.04	
2,4-Dinitrophenol	U	U	U	50
4-Nitrophenol	U	U	U	50
Dibenzofuran	U	U	U	10
2,4-Dinitrotoluene	U	U	U	10
Diethylphthalate	U	U	.3J	10
4-Chlorophenyl-phenylether	U	U	U	10
Fluorene	U	U	U	10
4-Nitroaniline	U	U	U	20
4,6-Dinitro-2-methylphenol	U	U	U	50
N-Nitrosodiphenylamine (1)	U	U	U	10
4-Bromophenyl-phenylether	U	U	U	10
Hexachlorobenzene	U	U	U	10
Pentachlorophenol	U	U	U	50
Phenanthrene	U	U	U	10
Anthracene	U	U	U	10
Carbazole	U	U	U	10
Di-n-butylphthalate	.3J	.3JB	.4JB	10
Fluoranthene	U	U	U	10
Pyrene	U	U	U	10
Butylbenzylphthalate	U	U	U	10
3,3'-Dichlorobenzidine	U	U	U	20
Benzo(a)anthracene	U	U	U	10
Chrysene	U	U	U	10
bis(2-Ethylhexyl)phthalate	U	U	U	10
Di-n-octylphthalate	U	U	U	10
Benzo(b)fluoranthene	U	U	U	10
Benzo(k)fluoranthene	U	U	U	10
Benzo(a)pyrene	U	U	U	10
Indeno(1,2,3-cd)pyrene	U	U	U	10
Dibenzo(a,h)anthracene	U	U	U	10
Benzo(g,h,i)perylene	U	U	U	10
Date Received		05/16/98	05/16/98	
Date Extracted	05/20/98	05/20/98	05/20/98	
Date Analyzed	05/27/98	05/27/98	05/27/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

ORGANICS APPENDIX

U - Indicates that the compound was analyzed for but not detected.

J - Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B - This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N - Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S - Estimated due to surrogate outliers.

X - Matrix spike compound.

(1) - Cannot be separated.

(2) - Decomposes to azobenzene. Measured and calibrated as azobenzene.

A - This flag indicates that a TIC is a suspected aldol condensation product.

E - Indicates that it exceeds calibration curve range.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C - Confirmed by GC/MS.

T - Compound present in TCLP blank.

P - This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE 5-14-98 PAGE: 1 OF 1

AEN(NM) Accession #: 805356

SHADED AREAS FOR LAB USE ONLY

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co./Ciniza
COMPANY: Same
ADDRESS:

ANALYSIS REQUESTED

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8270 Semi volatiles	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
GW-1-51398 A	5/13/98	1030	H_2O	01											X																	2
GW-2-51398 A	"	1130	"	02											X																	2
GW-3-51398 A	"	1345	"	03											X																	2

PROJECT INFORMATION

~~PROJ. NO.~~: Annual GW
PROJ. NAME: Samples
~~P.O. NO.~~: 1998
SHIPPED VIA:

SAMPLE RECEIPT

NO. OF CONTAINERS	6
CUSTODY SEAL	Y / N / N/A
RECEIVED INTACT	Y
BLUE ICE/ICE	Y / N

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1

Signature: [signature] Time: 0830
Printed Name: Steve Morris Date: 5/14/98
Company: Giant

RELINQUISHED BY: 2

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: LAB 2

Signature: [illegible] Time: [illegible]
Printed Name: [illegible] Date: [illegible]
Company: American Environmental Network (NM), Inc.

action: (BNA) Pesticide-PCB/ Herbicide/ O/P Pest/ Other
(Circle One)

CLIENT : [illegible]

JOB NO(S).: 1102A

SAMPLE IN (Extractions)					SAMPLE IN (Extractions)				
Sample(s)	Date	Time	Sign.	Location	Sample(s)	Date	Time	Sign.	Location
01-03	05/24/98	15:30	SBW	29					

SAMPLE OUT					SAMPLE IN			
Sample(s)	Date	Time	Code	Sign.	Date	Time	Location	Sign.
1-3	5/29/98	1P	AN	JS	5/29/98	4P	2C	JS

Codes: SC = Screening AN = Analysis

Verified by: M. Cubik Date: 5/29/98

a: SMF00200.CT

IEA-CT ANALYTICAL SUMMARY

Client ID: 805356-01, 805356-02, 805356-03
Job Number: 7098-1102A

Date: 6/23/98

)ty	Matrix	Analysis	Description
3	WATER	BNA-8270B-TCL	TCL Semi-Volatile Or

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the AEN-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

AEN-Connecticut
Certification Summary (as of September 1997)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Human Services	Wastewater	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste	10602
North Carolina	Division of Environmental Management	Wastewater Hazardous Waste	388
North Dakota	Department of Health and Consolidated Laboratories	Non-Potable/Potable Hazardous Waste	R-138
Oklahoma	Department of Environmental Quality	General Water Quality/ Sludge Testing	9614
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Washington	Department of Ecology	Wastewater/ Hazardous Waste	C231
West Virginia	Division of Environmental Protection	Wastewater/ Hazardous Waste	263
Wisconsin	Department of Natural Resources	Wastewater/ Hazardous Waste	998355710

3C

WATER SEMIVOLATILE SPIKE/SPIKE DUPLICATE RECOVERY SUMMARY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 1102A SAS No.: _____ SDG No.: A1102

Matrix Spike - EPA Sample No.: SBLKYI

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	SPIKE CONCENTRATION (ug/L)	SPIKE % REC #	QC. LIMITS REC.
Phenol	40	0	13	32	5-112
bis(2-Chloroethyl)ether	40	0	26	65	12-158
2-Chlorophenol	40	0	27	68	23-134
1,3-Dichlorobenzene	40	0	21	52	01-172
1,4-Dichlorobenzene	40	0	21	52	20-124
Benzyl alcohol	40	0	25	62	8-132
1,2-Dichlorobenzene	40	0	23	58	32-129
2-Methylphenol	40	0	22	55	37-113
bis(2-Chloroisopropyl)ether	40	0	28	70	36-166
4-Methylphenol	40	0	19	48	32-108
N-Nitroso-di-n-propylamine	40	0	28	70	01-230
Hexachloroethane	40	0	19	48	40-113
Nitrobenzene	40	0	28	70	35-180
Isophorone	40	0	28	70	21-196
-Nitrophenol	40	0	33	82	29-182
2,4-Dimethylphenol	40	0	29	72	64-238
Benzoic acid	40	0	0	0*	01-474
bis(2-Chloroethoxy)methane	40	0	25	62	33-184
2,4-Dichlorophenol	40	0	29	72	44-117
1,2,4-Trichlorobenzene	40	0	24	60	44-142
Naphthalene	40	0	28	70	21-133
4-Chloroaniline	40	0	37	92	01-368
Hexachlorobutadiene	40	0	23	58	24-116
4-Chloro-3-methylphenol	40	0	28	70	22-147
2-Methylnaphthalene	40	0	26	65	36-112
Hexachlorocyclopentadiene	40	0	14	35	01-74
2,4,6-Trichlorophenol	40	0	31	78	34-144
2,4,5-Trichlorophenol	40	0	28	70	45-129
2-Chloronaphthalene	40	0	32	80	60-118
2-Nitroaniline	40	0	30	75	61-138

Column to be used to flag recovery with an asterisk

* Values outside of QC limits.

Spike Recovery: ~~0~~ 1 out of 65 outside limits

COMMENTS: PS 05/29/98

FORM III SV-1

3C

WATER SEMIVOLATILE SPIKE/SPIKE DUPLICATE RECOVERY SUMMARY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 1102A SAS No.: _____ SDG No.: A1102

Matrix Spike - EPA Sample No.: SBLKYI

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	SPIKE CONCENTRATION (ug/L)	SPIKE % REC #	QC. LIMITS REC.
Dimethylphthalate	40	0	32	80	01-112
Acenaphthylene	40	0	29	72	33-145
2,6-Dinitrotoluene	40	0	31	78	50-158
3-Nitroaniline	40	0	47	118	01-644
Acenaphthene	40	0	29	72	47-145
2,4-Dinitrophenol	40	0	28	70	01-191
4-Nitrophenol	40	0	17	42	01-132
Dibenzofuran	40	0	30	75	52-123
2,4-Dinitrotoluene	40	0	31	78	39-139
Diethylphthalate	40	0	31	78	01-114
4-Chlorophenyl-phenylether	40	0	30	75	25-158
Fluorene	40	0	32	80	59-121
4-Nitroaniline	40	0	41	102	5-194
4,6-Dinitro-2-methylphenol	40	0	36	90	01-181
-Nitrosodiphenylamine (1)	40	0	35	88	11-169
4-Bromophenyl-phenylether	40	0	32	80	53-127
Hexachlorobenzene	40	0	31	78	01-152
Pentachlorophenol	40	0	30	75	14-176
Phenanthrene	40	0	34	85	54-120
Anthracene	40	0	33	82	27-133
Di-n-butylphthalate	40	.3	35	87	1-118
Fluoranthene	40	0	35	88	26-137
Pyrene	40	0	32	80	52-115
Butylbenzylphthalate	40	0	31	78	01-152
3,3'-Dichlorobenzidine	40	0	37	92	01-262
Benzo(a)anthracene	40	0	33	82	33-143
Chrysene	40	0	32	80	17-168
bis(2-Ethylhexyl)phthalate	40	0	32	80	8-158
Di-n-octylphthalate	40	0	32	80	4-146
Benzo(b)fluoranthene	40	0	32	80	24-159

Column to be used to flag recovery with an asterisk

* Values outside of QC limits.

Spike Recovery: ~~0~~ 1 out of 65 outside limits

COMMENTS: PS 05/29/98

FORM III SV-1

3C

WATER SEMIVOLATILE SPIKE/SPIKE DUPLICATE RECOVERY SUMMARY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 1102A SAS No.: _____ SDG No.: A1102

Matrix Spike - EPA Sample No.: SBLKYI

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	SPIKE CONCENTRATION (ug/L)	SPIKE % REC #	QC. LIMITS REC.
Benzo(k)fluoranthene	40	0	35	88	11-162
Benzo(a)pyrene	40	0	33	82	17-163
Indeno(1,2,3-cd)pyrene	40	0	26	65	01-171
Dibenzo(a,h)anthracene	40	0	22	55	01-227
Benzo(g,h,i)perylene	40	0	27	68	01-219
					-
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					-
					-
					-
					-
					-
					-
					-

Column to be used to flag recovery with an asterisk

* Values outside of QC limits.

Spike Recovery: ~~0~~ 1 out of 65 outside limits

COMMENTS: PS 05/29/88

FORM III SV-1

American Environmental Network, Inc.

AEN I.D. 805357

OW 2

June 12, 1998

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name ANNUAL GW SAMPLING
Project Number (none)

Attention: STEVE MORRIS

On 5/15/98 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze aqueous samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

This report is being reissued in part to correct the client ID. This report was originally dated 6/10/98. We apologize for any inconvenience this may have caused.

EPA method 150.1 and 8260 were performed by American Environmental Network (NM) Inc., Albuquerque, NM.

All other parameters were performed by American Environmental Network (CT) Inc., Monroe, CT.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: 5-14-98 PAGE: 1 OF 1

[redacted]

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210

BILL TO: Giant Refining Co. / Ciniza
COMPANY: Same
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	SEE ATTACHED LIST	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	
GW-1-51398	5/13/98	1930	H_2O	[redacted]											X																	
GW-2-51398	"	1130	"												X																	
GW-3-51398	"	1345	"												X																	

PROJECT INFORMATION

PROJ. NO.: Annual
PROJ. NAME: groundwater
P.O. NO.: sampling
SHIPPED VIA: event 1998

SAMPLE RECEIPT

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

Passed Rad Screen

RELINQUISHED BY

Signature: [signature] Time: 0830
Printed Name: Steve Morris Date: 5/14/98
Company: Giant

RECEIVED BY

Signature: [signature] Time:
Printed Name: R Sequin Date: 5/14/98
Company: AENet

RELINQUISHED BY

Signature: Time:
Printed Name: Date:
Company:

[redacted]

PLEASE FILL THIS FORM IN COMPLETELY.

1/5/98 AEN Inc - American Environmental Network (NM) Inc.

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE: 5-14-98 PAGE: 1 OF 1

AEN NM Accession #: [illegible]

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co. / Ciniza
COMPANY: Same
ADDRESS:

FOR LAB USE ONLY

SHADED AREAS

PLEASE FILL THIS FORM IN COMPLETELY.

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	SEE ATTACHED LIST	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:	pH		Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
OW-1-51398	5/13/98	1930	H_2O	[illegible]											X		X								X							
OW-2-51398	"	1130	"	[illegible]											X		X								X							
OW-3-51398	"	1345	"	[illegible]											X		X								X							

PROJECT INFORMATION	PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS
~~PROJ. NO.~~: Annual	(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐
PROJ. NAME: groundwater	CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER
P.O. NO.: sampling	METHANOL PRESERVATION ☐
SHIPPED VIA: aug 1998	COMMENTS: FIXED FEE ☐

SAMPLE RECEIPT	
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

RELINQUISHED BY: 1	RELINQUISHED BY: 2
Signature: [illegible] Time: 0830	Signature: Time:
Printed Name: Steve Morris Date: 5/14/98	Printed Name: Date:
Company: Giant	Company:
RECEIVED BY: 1	RECEIVED BY: LAB 2
Signature: Time:	[illegible]
Printed Name: Date:	[illegible]
Company:	[illegible]

ANALYTICAL PARAMETERS

WELL	pH	Cond	TOC*	TOX*	TDS	ALKAL BICARB	ALKAL CARB	CHLORIDE	SULFATE	PHENOL	VOL-ORG 8260	BTEX 8260	TOTAL METALS Cr	Pb	Hg	DISSOLVED METALS As	Ba	Cd	Ca	Mg	Mn	K	Se	Ag	Na
MW-1	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
OW-11	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
SMW-3	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-4	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-5	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
SMW-6	X	X	X	X	X	X	X	X	X		X		X	X					X	X		X			X
OW-1	X	X			X	X	X	X	X			X							X	X		X			X
OW-2	X	X			X	X	X	X	X			X							X	X		X			X
OW-3	X	X			X	X	X	X	X			X							X	X		X			X
OW-12												X													
OW-29												X													
OW-30												X													

* TOC - 2 replicates & original

* TOX - 3 replicates & original

AMERICAN ENVIRONMENTAL NETWORK
Albuquerque, New Mexico

Interlab Chain of Custody

DATE: 5/15 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: AMERICAN ENVIRONMENTAL NETWORK
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

7098-1103A

CLIENT PROJECT MANAGER:

Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)	X Ca, Mg, K, Na		TOX	TOC	Gen Chemistry			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
805357-01	5/13/98	1030	AQ	01					X																								
-02		1130	AQ	02					X																								
-03		1345	AQ	03					X																								

Passed Rad Screen
5/16/98 5°C

PROJECT INFORMATION	
PROJECT NUMBER:	805357
PROJECT NAME:	Giant Refining Co.
QC LEVEL:	STD IV
QC REQUIRED:	MS MSD BLANK
TAT:	STANDARD RUSHI

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 5/29 - 6/5
RUSH SURCHARGE:
CLIENT DISCOUNT:
SPECIAL CERTIFICATION REQUIRED: ☐ YES ☐ NO

X = Dissolved Metals

Passed Rad Screen

SAMPLES SENT TO:	
CONNECTICUT	X
ILLINOIS	
MASSACHUSETTS	
PENSACOLA	
PORTLAND	
PHOENIX	
N.CAROLINA	

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: John Caldwell Time: 1700	Signature: Time:
Printed Name: John Caldwell Date: 5/15/98	Printed Name: Date:
Albuquerque	Company:
RECEIVED BY: (LAB) 1.	RECEIVED BY: ~~(LAB)~~ 2.
Signature: Time: 10:00	Signature: Time:
Printed Name: P. Sequin Date: 5/16/98	Printed Name: Date:
Company: AENV CT	Company:

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	DATE RECEIVED	: 5/15/98
PROJECT NAME	: ANNUAL GW SAMPLING	REPORT DATE	: 6/10/98

June 12, 1998

ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-1-51398	AQUEOUS	5/13/98
02	OW-2-51398	AQUEOUS	5/13/98
03	OW-3-51398	AQUEOUS	5/13/98

American Environmental Network
200 Monroe Turnpike • Monroe, CT 06468 • (203) 261-4458 • Fax (203) 268-5346

June 04, 1998

Ms. Kim Mcneill
AEN-NEW MEXICO
2709-D Pan American Freeway, Ne
Albuquerque, NM 87107

Dear Ms. Mcneill :

Please find enclosed the analytical results of 3 sample(s) received at our laboratory on May 16, 1998. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

IEA Report #7098-1103A	Purchase Order #805357
Project ID: 805357	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Cheryl A. Cascella for
Jeffrey C. Curran
Laboratory Manager

JCC

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	DATE RECEIVED	: 5/15/98
PROJECT NAME	: ANNUAL GW SAMPLING	REPORT DATE	: 6/10/98

June 12, 1998

ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-1-51398	AQUEOUS	5/13/98
02	OW-2-51398	AQUEOUS	5/13/98
03	OW-3-51398	AQUEOUS	5/13/98

7098-1103A
AEN-NEW MEXICO
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
805357-01	981103A-01	WATER	05/13/98	05/16/98
805357-02	981103A-02	WATER	05/13/98	05/16/98
805357-03	981103A-03	WATER	05/13/98	05/16/98

IEA-CT ANALYTICAL SUMMARY

Client ID: 805357-01, 805357-02, 805357-03
Job Number: 7098-1103A

Date: 6/4/98

Qty	Matrix	Analysis	Description
3	WATER	ALK-310.1	Alkalinity
3	WATER	CA-SW846-D	Calcium (Dissolved)
3	WATER	CHLORIDE-325.2	Chloride
3	WATER	COND-120.1	Conductivity
3	WATER	K-SW846-D	Potassium (Dissolved
3	WATER	MET-PREP-ICAP-D	Metals ICAP Prep (Di
3	WATER	MG-SW846-D	Magnesium (Dissolved
3	WATER	NA-SW846-D	Sodium (Dissolved)
3	WATER	SULFATE-375.2	Sulfate
3	WATER	TDS-160.1	Total Dissolved Soli

AEN Connecticut
Internal Chain-of-Custody

Client: AEN NM

AEN Job #: 2098-1103A

Custody Seal: present / absent
intact / not intact

Airbill #: FE

Sample #s: 01-03

Field C-O-C: present / absent

Locations: 3, 6

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1-3	[illegible]	R Guerrero	5/19	17:30	Alkal	R Guerrero	[illegible]	5/19	23:00
1-3	[illegible]	[illegible]	5/21	1345	CHCOCIPE	M. Bourgeau	[illegible]	5/27/98	14:45
1-3	[illegible]	[illegible]	5/28	1200	cunhut	SDM	[illegible]	5/29	21:30

AS:022189:0

an environmental testing company
200 Monroe Turnpike
Monroe, Connecticut 06468
(203) 261-4458
FAX (203) 268-5346

CHAIN OF CUSTODY
ATOMIC SPECTROSCOPY DEPARTMENT

Job Number 7098-1103A Sample Numbers 01-03

WATER - SOIL - SLUDGE - EPTOX/TCLP

I confirm that I have performed the preparation below following SOP guidelines and authorize the release of this preparation:

Sample Prep

	05/26/98	ICP/FLME
		FURN
Chemist	Date(s)	MERCURY

I confirm that I have performed the analysis below following SOP guidelines and authorize the release of all associated data:

Analysis

	05/28/98	ICP
		FLAME
		FURN
Chemist	Date(s)	MERCURY

I have reviewed and authorize the release of this job:

Complete

Supervisor	5/29/98 Date

Batch Assignment

American Environmental Network, Inc.

GENERAL CHEMISTRY RESULTS

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	DATE RECEIVED	: 5/15/98
PROJECT NAME	: ANNUAL GW SAMPLING		

SAMPLE 'D. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE ANALYZED
)1	OW-1-51398	AQUEOUS	5/13/98	5/29/98
02	OW-2-51398	AQUEOUS	5/13/98	5/29/98
03	OW-3-51398	AQUEOUS	5/13/98	5/29/98

PARAMETER	UNITS	01	02	03
PH (150.1)	UNITS	8.82	7.95	7.95

CHEMIST NOTES:
N/A

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)	DATE RECEIVED :	5/15/98
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805357-02	OW-2-51398	AQUEOUS	5/13/98	N/A	05/19/98	1

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)	DATE RECEIVED :	5/15/98
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805357-02	OW-2-51398	AQUEOUS	5/13/98	N/A	05/19/98	1

PARAMETER	DET. LIMIT		UNITS
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L
Styrene	1.0	< 1.0	ug/L
Bromoform	1.0	< 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L
1,2,3-Trichloropropane	1.0	< 1.0	ug/L
Isopropyl Benzene	1.0	< 1.0	ug/L
Bromobenzene	1.0	< 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L
n-Propylbenzene	1.0	< 1.0	ug/L
2-Chlorotoluene	1.0	< 1.0	ug/L
4-Chlorotoluene	1.0	< 1.0	ug/L
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L
tert-Butylbenzene	1.0	< 1.0	ug/L
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L
sec-Butylbenzene	1.0	< 1.0	ug/L
1,3-Dichlorobenzene	1.0	< 1.0	ug/L
1,4-Dichlorobenzene	1.0	< 1.0	ug/L
p-Isopropyltoluene	1.0	< 1.0	ug/L
1,2-Dichlorobenzene	1.0	< 1.0	ug/L
n-Butylbenzene	1.0	< 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L
Naphthalene	1.0	< 1.0	ug/L
Hexachlorobutadiene	1.0	< 1.0	ug/L
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	102
	(80 - 120)
Toluene-d8	102
	(88 - 110)
Bromofluorobenzene	95
	(86 - 115)

7098-1103A
AEN/NEW MEXICO

Case Narrative

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for the samples analyzed in this SDG. No analytical problems were encountered.

Analyte	Method	Reference
Alkalinity	310.1	1
Chloride	325.2	1
Conductivity	120.1	1
Sulfate	375.2	1
TDS	160.1	1

References:

1. Methods of Chemical Analysis of Water and Wastes, EPA 600, 1983.

Metals - ICAP metals were determined using a JA61E trace ICAP using guidance provided in SW846 according to the following methods: ICAP-3010/6010.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

IEC's are electronically employed by the JA61E trace ICAP. However, the ICSA is utilized as a monitoring device to detect any additional adjustments that may be required. These modifications are calculated and applied manually. They are so noted in the raw data.

Alkalinity
Bicarbonate/Carbonate

	Total Alkalinity ppm	Bicarb. ppm	Carbonate ppm
OW-1-51398	408	392.07	15.72
OW-2-51398	667	662.56	4.41
OW-3-51398	650	645.77	4.20

TABLE AS-1.0
7098-1103A
AEN-NEW MEXICO
MISCELLANEOUS ATOMIC SPECTROSCOPY

Aqueou

All values are ug/L.

Client Sample I.D.	OW-1-51398 805357-01	OW-2-51398 805357-02	OW-3-51398 805357-03	
Lab Sample I.D.	981103A-01	981103A-02	981103A-03	
Calcium	5000U	9770	10100	
Magnesium	5000U	5000U	5000U	
Potassium	5000U	5000U	5000U	
Sodium	174000	170000	166000	

See Appendix for qualifier definitions

WET CHEM ANALYSIS DATA SHEET

SAMPLE NO.

805357-02 OW-2-51398

Lab Name: IEA Contract:

Lab Code: IEA Case No.: 1103A SAS No. : SDG No.: A1103

Matrix: (soil/water) WATER Lab Sample ID: 1103002

% Solids: Date Received: 05/16/98

Concentration Units (mg/L or mg/kg dry weight) : mg/L

Analyte	Concentration	C	Q	M
ALKALIN	667.			
CHLORIDE	42.2			
CONDUCT	1340.			
SULFATE	27.2			
TDS	793.			

Comments:

FORM I - WC

INORGANICS APPENDIX

C - Concentration qualifiers

U - Indicates analyte was not detected at method reporting limit.

B - Indicates analyte result between IDL and contract required detection limit (CRDL)

Q - QC qualifiers

E - Reported value is estimated because of the presence of interference

M - Duplicate injection precision not met

N - Spiked sample recovery not within control limits

S - The reported value was determined by the method of standard additions (MSA)

W - Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M - Method codes

P - ICP

A - Flame AA

F - Furnace AA

CV - Cold vapor AA (manual)

C - Cyanide

NR - Not Required

NC - Not Calculated as per protocols

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)		
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT 1998		

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	051898	AQUEOUS	N/A	05/18/98	1

PARAMETER	DET. LIMIT		UNITS
Dichlorodifluoromethane	1.0	< 1.0	ug/L
Chloromethane	1.0	< 1.0	ug/L
Vinyl Chloride	1.0	< 1.0	ug/L
Bromomethane	1.0	< 1.0	ug/L
Chloroethane	1.0	< 1.0	ug/L
Trichlorofluoromethane	1.0	< 1.0	ug/L
Acetone	10	< 10	ug/L
Acrolein	5.0	< 5.0	ug/L
1,1-Dichloroethene	1.0	< 1.0	ug/L
Iodomethane	1.0	< 1.0	ug/L
Methylene Chloride	1.0	< 1.0	ug/L
Acrylonitrile	5.0	< 5.0	ug/L
cis-1,2-Dichloroethene	1.0	< 1.0	ug/L
Methyl-t-butyl Ether	1.0	< 1.0	ug/L
1,1,2,1,2,2-Trichlorotrifluoroethane	1.0	< 1.0	ug/L
1,1-Dichloroethane	1.0	< 1.0	ug/L
trans-1,2-Dichloroethene	1.0	< 1.0	ug/L
2-Butanone	10	< 10	ug/L
Carbon Disulfide	1.0	< 1.0	ug/L
Bromochloromethane	1.0	< 1.0	ug/L
Chloroform	1.0	< 1.0	ug/L
2,2-Dichloropropane	1.0	< 1.0	ug/L
1,2-Dichloroethane	1.0	< 1.0	ug/L
Vinyl Acetate	1.0	< 1.0	ug/L
1,1,1-Trichloroethane	1.0	< 1.0	ug/L
1,1-Dichloropropene	1.0	< 1.0	ug/L
Carbon Tetrachloride	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
1,2-Dichloropropane	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Bromodichloromethane	1.0	< 1.0	ug/L
2-Chloroethyl Vinyl Ether	10	< 10	ug/L
cis-1,3-Dichloropropene	1.0	< 1.0	ug/L
trans-1,3-Dichloropropene	1.0	< 1.0	ug/L
1,1,2-Trichloroethane	1.0	< 1.0	ug/L
1,3-Dichloropropane	1.0	< 1.0	ug/L
Dibromomethane	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
1,2-Dibromoethane	1.0	< 1.0	ug/L
4-Methyl-2-Pentanone	10	< 10	ug/L
2-Hexanone	10	< 10	ug/L
Dibromochloromethane	1.0	< 1.0	ug/L
Tetrachloroethene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
1,1,1,2-Tetrachloroethane	1.0	< 1.0	ug/L

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805357
PROJECT #	: (none)		
PROJECT NAME	: ANNUAL GROUNDWATER SAMPLING EVENT 1998		

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	051898	AQUEOUS	N/A	05/18/98	1

PARAMETER	DET. LIMIT		UNITS
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L
Styrene	1.0	< 1.0	ug/L
Bromoform	1.0	< 1.0	ug/L
1,1,2,2-Tetrachloroethane	1.0	< 1.0	ug/L
1,2,3-Trichloropropane	1.0	< 1.0	ug/L
Isopropyl Benzene	1.0	< 1.0	ug/L
Bromobenzene	1.0	< 1.0	ug/L
trans-1,4-Dichloro-2-Butene	1.0	< 1.0	ug/L
n-Propylbenzene	1.0	< 1.0	ug/L
2-Chlorotoluene	1.0	< 1.0	ug/L
4-Chlorotoluene	1.0	< 1.0	ug/L
1,3,5-Trimethylbenzene	1.0	< 1.0	ug/L
tert-Butylbenzene	1.0	< 1.0	ug/L
1,2,4-Trimethylbenzene	1.0	< 1.0	ug/L
sec-Butylbenzene	1.0	< 1.0	ug/L
1,3-Dichlorobenzene	1.0	< 1.0	ug/L
1,4-Dichlorobenzene	1.0	< 1.0	ug/L
p-Isopropyltoluene	1.0	< 1.0	ug/L
1,2-Dichlorobenzene	1.0	< 1.0	ug/L
n-Butylbenzene	1.0	< 1.0	ug/L
1,2-Dibromomo-3-chloropropane	1.0	< 1.0	ug/L
1,2,4-Trichlorobenzene	1.0	< 1.0	ug/L
Naphthalene	1.0	< 1.0	ug/L
Hexachlorobutadiene	1.0	< 1.0	ug/L
1,2,3-Trichlorobenzene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	100
	(80 - 120)
Toluene-d8	99
	(88 - 110)
Bromofluorobenzene	93
	(86 - 115)

American Environmental Network, Inc.

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805357
PROJECT #	: (none)	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: ANNUAL GW SAMPLING		

PARAMETER	UNITS	AEN I.D.	SAMPLE RESULT	DUP. RESULT	% RPD
PH	UNITS	805357-01	8.82	8.68	2

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

U.S. EPA - CLP

3
BLANKS

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: _____ SAS No.: _____ SDG No.: A1103

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Calcium									5000.000	U	P
Magnesium									5000.000	U	P
Potassium									5000.000	U	P
Sodium									5000.000	U	P

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

007S

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 1103 SAS No.: _____ SDG No.: A1103

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Calcium		143413.6000		124048.9000		20000.00	96.8		P
Magnesium	75-125	37520.7900		17036.8400		20000.00	102.4		P
Potassium	75-125	28601.9500		6136.4570		20000.00	112.3		P
Sodium	75-125	74846.1200		56376.0200		20000.00	92.4		P

Comments:

U.S. EPA - CLP

6
DUPLICATES

EPA SAMPLE NO.

007D

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: 1103 SAS No.: _____ SDG No.: A1103

Matrix: WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Calcium		124048.9000		125514.8000		1.2		P
Magnesium	.0	17036.8400		17120.2100		0.5		P
Potassium	.0	6136.4570		6137.9810				P
Sodium		56376.0200		58248.3000		3.3		P

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: IEA Contract: _____

Lab Code: IEA Case No.: _____ SAS No.: _____ SDG No.: A1103

Solid LCS Source: _____

Aqueous LCS Source: INORG. VENT.

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Calcium	20000.0	21215.26	106.1						
Magnesium	20000.0	20593.30	103.0						
Potassium	20000.0	17405.09	87.0						
Sodium	20000.0	19527.61	97.6						

IEA

CLASSICAL CHEMISTRY
QUALITY CONTROL SUMMARY REPORT

JOB # : 3098-1103A
CLIENT : IEA / CT

UNITS : mg/L

ANALYTE	SAMPLE ID	SAMPLE RESULT	DUPLICATE RESULT	RPD	SPIKE RESULT	SPIKE ADDED	% RECOVERY	METHOD BLANK
ALKALIN	1103A-01	408	406	0.49	NA			<2.0
CHLORIDE	1033A-01	39.15	39.12	0.18	94.87	60.0	92.9	<3.0
CONDUCT	1090A-01	1422	1434	0.84	NA			0.38
SULFATE	1033A-01	123	122	0.82	142.2	30.0	64.0	<10.0
TDS	1162A-04	507	511	0.79	NA			<10.0

American Environmental Network, Inc.

Spike Recovery and RPD Summary Report - WATER

Method : C:\HPCHEM\1\METHODS\82600310.M (RTE Integrator)
Title : AEN New Mexico GC/MS
Last Update : Tue May 12 14:39:09 1998
Response via : Initial Calibration

Non-Spiked Sample: 05199801.D

	Spike Sample	Spike Duplicate Sample
File ID :	051898S3.D	051898S4.D
Sample :	805357-01 MS	805357-01 MSD
Acq Time:	18 May 98 7:47 pm	18 May 98 8:25 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-Dichloroethene	0.0	50	51	49	101	99	2	14	61-145
Benzene	0.0	50	52	51	103	102	1	11	76-127
Trichloroethene	0.0	50	50	49	99	98	1	14	71-120
Toluene	0.0	50	50	49	100	98	2	13	76-125
Chlorobenzene	0.0	50	49	48	98	95	3	13	75-130

- Fails Limit Check

82600310.M Tue May 19 14:35:01 1998

American Environmental Network, Inc.

AEN I.D. **805356**

June 24, 1998

Giant Refining Company
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: ANNUAL GW SAMPLES

Attention: Steve Morris

On **05/15/98**, American Environmental Network (NM) Inc., (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

All analyses were performed by American Environmental Network (CT), Inc., Monroe, CT.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
General Manager

MR:jt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE 5-14-98 PAGE: 1 OF 1

AEN(NM) Accession #: [illegible]

SHADED AREAS FOR LAB USE ONLY

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co./Ciniza
COMPANY: Same
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8270 Semi-volatiles	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	NUMBER OF CONTAINERS
GW-1-51398 A	5/13/98	1030	H_2O												X																	2
GW-2-51398 A	"	1130	"												X																	2
GW-3-51398 A	"	1345	"												X																	2

PROJECT INFORMATION

~~PROJ. NO.~~: Annual GW
PROJ. NAME: Samples
~~P.O. NO.~~: 1998
SHIPPED VIA:

SAMPLE RECEIPT

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☐
CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER
METHANOL PRESERVATION ☐
COMMENTS: FIXED FEE ☐

RELINQUISHED BY: 1

Signature: [signature] Time: 0830
Printed Name: Steve Morris Date: 5/14/98
Company: Giant

RELINQUISHED BY: 2

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: 1

Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY LAB: 2

[illegible]

AMERICAN ENVIRONMENTAL NETWORK
Albuquerque, New Mexico

Interlab Chain of Custody

DATE: 5/15 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: AMERICAN ENVIRONMENTAL NETWORK
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

7098-
1102A

CLIENT PROJECT MANAGER:
Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
805356 -01	5/13/98	1030	AQ	01																	X												
(-02	)	1130	AQ	02																	X												
(-03	)	1345	AQ	03																	X												

Passed Rad Screen
5/16/98 5°C

PROJECT INFORMATION	
PROJECT NUMBER: 805356	
PROJECT NAME: Giant Refining Co.	
QC LEVEL: (STD.) IV	
QC REQUIRED: MS MSD BLANK	
TAT: (STANDARD) RUSH!	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 5/28 - 6/5
RUSH SURCHARGE:
CLIENT DISCOUNT:
SPECIAL CERTIFICATION REQUIRED: ☐YES ☐NO

Passed Rad Screen

SAMPLES SENT TO:
CONNECTICUT X
ILLINOIS
MASSACHUSETTS
PENSACOLA
PORTLAND
PHOENIX
N.CAROLINA

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Time: 1200	Signature: Time:
Printed Name: John Caldwell Date: 5/15/98	Printed Name: Date:
Albuquerque	Company:
RECEIVED BY: (LAB) 1.	**RECEIVED BY: ~~(LAB)~~ 2.**
Signature: PSeq Time:	Signature: Time:
Printed Name: PSEQUIN Date: 5/16/98	Printed Name: Date:
Company: AENET	Company:

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	DATE RECEIVED	: 05/15/98
PROJECT #	: (NONE)		
PROJECT NAME	: ANNUAL GW SAMPLES	REPORT DATE	: 06/24/98

AEN ID: 805356

	AEN ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	805356-01	OW-1-51398A	AQUEOUS	05/13/98
02	805356-02	OW-2-51398A	AQUEOUS	05/13/98
03	805356-03	OW-3-51398A	AQUEOUS	05/13/98

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	3

AEN STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

American Environmental Network
200 Monroe Turnpike • Monroe, CT 06468 • (203) 261-4458 • Fax (203) 268-5346

June 23, 1998

Ms. Kim Mcneill
AEN-NEW MEXICO
2709-D Pan American Freeway, Ne
Albuquerque, NM 87107

Dear Ms. Mcneill :

Please find enclosed the analytical results of 3 sample(s) received at our laboratory on May 16, 1998. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

IEA Report #7098-1102A	Purchase Order #805356
Project ID: 805356	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 261-4458 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Cheryl Cassella for

Jeffrey C. Curran
Laboratory Manager

JCC

7098-1102A
AEN/NEW MEXICO

Case Narrative

Semi-Volatile Organics - Semi-volatile organic samples were extracted and analyzed by capillary GC/MS using guidance provided in Methods 3510B/8270B. The instrumentation used was a Hewlett-Packard Gas Chromatograph interfaced with a Mass Selective Detector.

All samples were extracted, concentrated and analyzed without any apparent problems.

TABLE SV-1.0
7098-1102A
AEN-NEW MEXICO
TCL SEMI-VOLATILE ORGANICS

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	OW-1-51398A 805356-01	OW-2-51398A 805356-02	Quant. Limits with no Dilution
Lab Sample I.D.	SBLKYI	981102A-01	981102A-02	
Method Blank I.D.	SBLKYI	SBLKYI	SBLKYI	
Quant. Factor	1.00	1.05	1.04	
Phenol	U	U	U	10
bis(2-Chloroethyl)ether	U	U	U	10
2-Chlorophenol	U	U	U	10
1,3-Dichlorobenzene	U	U	U	10
1,4-Dichlorobenzene	U	U	U	10
Benzyl alcohol	U	U	U	10
1,2-Dichlorobenzene	U	U	U	10
2-Methylphenol	U	U	U	10
2,2'-oxybis(1-Chloropropane)	U	U	U	10
4-Methylphenol	U	U	U	10
N-Nitroso-di-n-propylamine	U	U	U	10
Hexachloroethane	U	U	U	10
Nitrobenzene	U	U	U	10
Isophorone	U	U	U	10
2-Nitrophenol	U	U	U	10
2,4-Dimethylphenol	U	U	U	10
Benzoic acid	U	U	U	50
bis(2-Chloroethoxy)methane	U	U	U	10
2,4-Dichlorophenol	U	U	U	10
1,2,4-Trichlorobenzene	U	U	U	10
Naphthalene	U	U	U	10
4-Chloroaniline	U	U	U	10
Hexachlorobutadiene	U	U	U	10
4-Chloro-3-methylphenol	U	U	U	10
2-Methylnaphthalene	U	U	U	10
Hexachlorocyclopentadiene	U	U	U	10
2,4,6-Trichlorophenol	U	U	U	10
2,4,5-Trichlorophenol	U	U	U	50
2-Chloronaphthalene	U	U	U	10
2-Nitroaniline	U	U	U	50
Dimethylphthalate	U	U	U	10
Acenaphthylene	U	U	U	10
2,6-Dinitrotoluene	U	U	U	10
3-Nitroaniline	U	U	U	50
Acenaphthene	U	U	U	10
Date Received		05/16/98	05/16/98	
Date Extracted	05/20/98	05/20/98	05/20/98	
Date Analyzed	05/27/98	05/27/98	05/27/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE SV-1.0
7098-1102A
AEN-NEW MEXICO
TCL SEMI-VOLATILE ORGANICS

All values are ug/L.

Client Sample I.D.	Method Blank	OW-1-51398A 805356-01	OW-2-51398A 805356-02	Quant. Limits with no Dilution
Lab Sample I.D.	SBLKYI	981102A-01	981102A-02	
Method Blank I.D.	SBLKYI	SBLKYI	SBLKYI	
Quant. Factor	1.00	1.05	1.04	
2,4-Dinitrophenol	U	U	U	50
4-Nitrophenol	U	U	U	50
Dibenzofuran	U	U	U	10
2,4-Dinitrotoluene	U	U	U	10
Diethylphthalate	U	U	.3J	10
4-Chlorophenyl-phenylether	U	U	U	10
Fluorene	U	U	U	10
4-Nitroaniline	U	U	U	20
4,6-Dinitro-2-methylphenol	U	U	U	50
N-Nitrosodiphenylamine (1)	U	U	U	10
4-Bromophenyl-phenylether	U	U	U	10
Hexachlorobenzene	U	U	U	10
Pentachlorophenol	U	U	U	50
Phenanthrene	U	U	U	10
Anthracene	U	U	U	10
Carbazole	U	U	U	10
Di-n-butylphthalate	.3J	.3JB	.4JB	10
Fluoranthene	U	U	U	10
Pyrene	U	U	U	10
Butylbenzylphthalate	U	U	U	10
3,3'-Dichlorobenzidine	U	U	U	20
Benzo(a)anthracene	U	U	U	10
Chrysene	U	U	U	10
bis(2-Ethylhexyl)phthalate	U	U	U	10
Di-n-octylphthalate	U	U	U	10
Benzo(b)fluoranthene	U	U	U	10
Benzo(k)fluoranthene	U	U	U	10
Benzo(a)pyrene	U	U	U	10
Indeno(1,2,3-cd)pyrene	U	U	U	10
Dibenzo(a,h)anthracene	U	U	U	10
Benzo(g,h,i)perylene	U	U	U	10
Date Received		05/16/98	05/16/98	
Date Extracted	05/20/98	05/20/98	05/20/98	
Date Analyzed	05/27/98	05/27/98	05/27/98	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

ORGANICS APPENDIX

U - Indicates that the compound was analyzed for but not detected.

J - Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B - This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N - Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S - Estimated due to surrogate outliers.

X - Matrix spike compound.

(1) - Cannot be separated.

(2) - Decomposes to azobenzene. Measured and calibrated as azobenzene.

A - This flag indicates that a TIC is a suspected aldol condensation product.

E - Indicates that it exceeds calibration curve range.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C - Confirmed by GC/MS.

T - Compound present in TCLP blank.

P - This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the AEN-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

AEN-Connecticut
Certification Summary (as of September 1997)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Human Services	Wastewater	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste	10602
North Carolina	Division of Environmental Management	Wastewater Hazardous Waste	388
North Dakota	Department of Health and Consolidated Laboratories	Non-Potable/Potable Hazardous Waste	R-138
Oklahoma	Department of Environmental Quality	General Water Quality/ Sludge Testing	9614
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Washington	Department of Ecology	Wastewater/ Hazardous Waste	C231
West Virginia	Division of Environmental Protection	Wastewater/ Hazardous Waste	263
Wisconsin	Department of Natural Resources	Wastewater/ Hazardous Waste	998355710

AEN Connecticut
Internal Chain-of-Custody

Client: AEN NM

AEN Job #: 7098-1102A

Custody Seal: present / absent
intact / not intact

Airbill #: FE

Sample #s: 01-03

Field C-O-C: present / absent

Locations: 08

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1-2-3	[illegible]	[illegible]	5/20/98	7:50	BNA	used			

Extraction: (BNA) Pesticide-PCB/ Herb...de/ O/P Pest/ Other
(Circle One)

CLIENT : [illegible]

JOB NO(S).: 1102A

SAMPLE IN (Extractions)					SAMPLE IN (Extractions)				
Sample(s)	Date	Time	Sign.	Location	Sample(s)	Date	Time	Sign.	Location
01-03	05/24/98	15:30	SBW	29					

SAMPLE OUT					SAMPLE IN			
Sample(s)	Date	Time	Code	Sign.	Date	Time	Location	Sign.
1-3	5/27/98	1P	[illegible]	[illegible]	5/27/98	4P	2C	[illegible]

Codes: SC = Screening AN = Analysis

Verified by: M. Cwik

Date: 5/29/98

ss: SMF00200.CT

3C

WATER SEMIVOLATILE SPIKE/SPIKE DUPLICATE RECOVERY SUMMARY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 1102A SAS No.: _____ SDG No.: A1102

Matrix Spike - EPA Sample No.: SBLKYI

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	SPIKE CONCENTRATION (ug/L)	SPIKE % REC #	QC. LIMITS REC.
Phenol	40	0	13	32	5-112
bis(2-Chloroethyl)ether	40	0	26	65	12-158
2-Chlorophenol	40	0	27	68	23-134
1,3-Dichlorobenzene	40	0	21	52	01-172
1,4-Dichlorobenzene	40	0	21	52	20-124
Benzyl alcohol	40	0	25	62	8-132
1,2-Dichlorobenzene	40	0	23	58	32-129
2-Methylphenol	40	0	22	55	37-113
bis(2-Chloroisopropyl)ether	40	0	28	70	36-166
4-Methylphenol	40	0	19	48	32-108
N-Nitroso-di-n-propylamine	40	0	28	70	01-230
Hexachloroethane	40	0	19	48	40-113
Nitrobenzene	40	0	28	70	35-180
Isophorone	40	0	28	70	21-196
-Nitrophenol	40	0	33	82	29-182
2,4-Dimethylphenol	40	0	29	72	64-238
Benzoic acid	40	0	0	0*	01-474
bis(2-Chloroethoxy)methane	40	0	25	62	33-184
2,4-Dichlorophenol	40	0	29	72	44-117
1,2,4-Trichlorobenzene	40	0	24	60	44-142
Naphthalene	40	0	28	70	21-133
4-Chloroaniline	40	0	37	92	01-368
Hexachlorobutadiene	40	0	23	58	24-116
4-Chloro-3-methylphenol	40	0	28	70	22-147
2-Methylnaphthalene	40	0	26	65	36-112
Hexachlorocyclopentadiene	40	0	14	35	01-74
2,4,6-Trichlorophenol	40	0	31	78	34-144
2,4,5-Trichlorophenol	40	0	28	70	45-129
2-Chloronaphthalene	40	0	32	80	60-118
2-Nitroaniline	40	0	30	75	61-138

Column to be used to flag recovery with an asterisk

* Values outside of QC limits.

Spike Recovery: ~~0~~ 1 out of 65 outside limits

COMMENTS: PS 05/09/98

FORM III SV-1

3C

WATER SEMIVOLATILE SPIKE/SPIKE DUPLICATE RECOVERY SUMMARY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 1102A SAS No.: _____ SDG No.: A1102

Matrix Spike - EPA Sample No.: SBLKYI

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	SPIKE CONCENTRATION (ug/L)	SPIKE % REC #	QC. LIMITS REC.
Dimethylphthalate	40	0	32	80	01-112
Acenaphthylene	40	0	29	72	33-145
2,6-Dinitrotoluene	40	0	31	78	50-158
3-Nitroaniline	40	0	47	118	01-644
Acenaphthene	40	0	29	72	47-145
2,4-Dinitrophenol	40	0	28	70	01-191
4-Nitrophenol	40	0	17	42	01-132
Dibenzofuran	40	0	30	75	52-123
2,4-Dinitrotoluene	40	0	31	78	39-139
Diethylphthalate	40	0	31	78	01-114
4-Chlorophenyl-phenylether	40	0	30	75	25-158
Fluorene	40	0	32	80	59-121
4-Nitroaniline	40	0	41	102	5-194
4,6-Dinitro-2-methylphenol	40	0	36	90	01-181
-Nitrosodiphenylamine (1)	40	0	35	88	11-169
4-Bromophenyl-phenylether	40	0	32	80	53-127
Hexachlorobenzene	40	0	31	78	01-152
Pentachlorophenol	40	0	30	75	14-176
Phenanthrene	40	0	34	85	54-120
Anthracene	40	0	33	82	27-133
Di-n-butylphthalate	40	.3	35	87	1-118
Fluoranthene	40	0	35	88	26-137
Pyrene	40	0	32	80	52-115
Butylbenzylphthalate	40	0	31	78	01-152
3,3'-Dichlorobenzidine	40	0	37	92	01-262
Benzo(a)anthracene	40	0	33	82	33-143
Chrysene	40	0	32	80	17-168
bis(2-Ethylhexyl)phthalate	40	0	32	80	8-158
Di-n-octylphthalate	40	0	32	80	4-146
Benzo(b)fluoranthene	40	0	32	80	24-159

Column to be used to flag recovery with an asterisk

* Values outside of QC limits.

Spike Recovery: 1 out of 65 outside limits

COMMENTS: PS 05/29/98

FORM III SV-1

3C

WATER SEMIVOLATILE SPIKE/SPIKE DUPLICATE RECOVERY SUMMARY

Lab Name: IEA/CT Contract: _____

Lab Code: IEACT Case No.: 1102A SAS No.: _____ SDG No.: A1102

Matrix Spike - EPA Sample No.: SBLKYI

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	SPIKE CONCENTRATION (ug/L)	SPIKE % REC #	QC. LIMITS REC.
Benzo(k)fluoranthene	40	0	35	88	11-162
Benzo(a)pyrene	40	0	33	82	17-163
Indeno(1,2,3-cd)pyrene	40	0	26	65	01-171
Dibenzo(a,h)anthracene	40	0	22	55	01-227
Benzo(g,h,i)perylene	40	0	27	68	01-219
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
					-
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					-
					-
					-
					-
					-
					-
					-
					-

Column to be used to flag recovery with an asterisk

* Values outside of QC limits.

Spike Recovery: ~~0~~ 1 out of 65 outside limits

COMMENTS: PS 05/29/98

FORM III SV-1

7098-1102A
AEN-NEW MEXICO
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
305356-01	981102A-01	WATER	05/13/98	05/16/98
305356-02	981102A-02	WATER	05/13/98	05/16/98
305356-03	981102A-03	WATER	05/13/98	05/16/98

IEA-CT ANALYTICAL SUMMARY

Client ID: 805356-01, 805356-02, 805356-03
Job Number: 7098-1102A

Date: 6/23/98

Qty	Matrix	Analysis	Description
3	WATER	BNA-8270B-TCL	TCL Semi-Volatile Or

Analytical Technologies, Inc. 9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105510

OW 5

June 10, 1991

Giant Refining Company
Route 3, P.O. Box 7
Gallup, NM 87301

Project Name/Number: RFI

Attention: Claud Rosendale

On 05/01/91, Analytical Technologies, Inc. received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

Sample OW-5 had matrix interferences for several metals (excluding As, Pb, K, and Mercury) analyses. These samples had to be diluted to be analyzed. Detection limits have been raised accordingly.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Elizabeth Proffitt
Senior Project Manager

Robert V. Woods
Laboratory Manager

Lorraine Davis
QA Coordinator

RVW:clf
Enclosure

AnalyticalTechnologies, Inc.
Phoenix, Arizona

Chain of Custody

DATE 4-30-91 PAGE 1 OF 1

PROJECT MANAGER: Elizabeth Proffitt

COMPANY: Giant Refining Co.
ADDRESS: Rt. 3 Box 7
Gallup, New Mexico 87301

BILL TO:
COMPANY: Same
ADDRESS:

Chad Kornblatt — SAMPLERS: (Signature)
(505) 722-0217 — PHONE NUMBER

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons (418.1)	OH	(MOD 8015) Gas/Diesel	Diesel/Gasoline/BTXE (MOD 8015/8020)	BTXE (8020)	Chlorinated Hydrocarbons (601/8010)	Aromatic Hydrocarbons (602/8020)	MTBE		Pesticides/PCB (608/8080)	Herbicides (615/8150)			Base/Neutral/Acid Compounds GC/MS (8270)	Volatile Organics GC/MS (8240) See Attached				SDWA Primary Standards	SDWA Secondary Standards	SDWA Volatiles (502.1/503.1)		The 13 Priority Pollutant Metals	The 8 EP Tox Metals by EP Tox Prep. (1310)	The 8 EP Tox Metals by Total Digestion	The 8 EP Tox Metals by TCLP (1311)	15 Background Metals (See Attached)		NUMBER OF CONTAINERS
MW-4	4-30	0850	Water	1		X												X	X												X		6
OW-5	4-30	0755	Water	2		X												X	X												X		6
OW-7	4-30	0919	Water	3		X												X	X												X		6
Trip Blank	—	—	Water	4															X														1

PROJECT INFORMATION	
PROJECT NO:	
PROJECT NAME:	RFI
P.O. NO.	01909
SHIPPED VIA:	Fed. Exp.
SAMPLE DISPOSAL INSTRUCTIONS	
☒ ATI	☐ RETURN

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	19
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	105510

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) X (RUSH) ☐ 24 ☐ 48 ☐ 72 ☐ 1 WEEK

Comments: See attached for specific analytical parameters

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Chad Kornblatt Time: 0930	Signature: Time:	Signature: Time:
Printed Name: Chad Kornblatt Date 4-30-91	Printed Name: Date	Printed Name: Date
Company: Giant Refining	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Linda Eshelman Time: 10:00
Printed Name: Date:	Printed Name: Date:	Printed Name: Linda Eshelman Date: 5/1/91
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10551002

TEST : VOLATILE ORGANICS (SKINNER LIST) EPA 8240

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 04/30/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/01/91
PROJECT NAME	: RFI	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-5	DATE ANALYZED	: 05/13/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CARBON DISULFIDE	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<5
BENZENE	<5
2-CHLOROETHYLVINYLETHER	<5
TOLUENE	<5
CHLOROBENZENE	<5
ETHYLBENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5
1,4-DIOXANE	<10
1,2-DIBROMOETHANE (EDB)	<2.5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	103
BROMOFLUOROBENZENE (%)	104
TOLUENE-D8 (%)	109

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 10551002

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

CLIENT	: GIANT REFINING CO.	DATE SAMPLED	: 04/30/91
PROJECT #	: (NONE)	DATE RECEIVED	: 05/01/91
PROJECT NAME	: RFI	DATE EXTRACTED	: 05/01/91
CLIENT I.D.	: OW-5	DATE ANALYZED	: 05/11/91
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
PHENOL	<5
1,3-DICHLOROBENZENE	<5
1,4-DICHLOROBENZENE	<5
1,2-DICHLOROBENZENE	<5
2-METHYLPHENOL	<5
4-METHLYPHENOL	<5
2,4-DIMETHYLPHENOL	<5
NAPHTHALENE	<5
DIMETHYLPHTHALATE	<5
2,4-DINITROPHENOL	<25
4-NITROPHENOL	<25
DIETHYLPHTHALATE	<5
PHENANTHRENE	<5
ANTHRACENE	<5
DI-N-BUTYLPHTHALATE	<5
FLUORANTHENE	<5
PYRENE	<5
BUTYLBENZYLPHTHALATE	<5
BENZO(a)ANTHRACENE	<5
BIS(2-ETHYLHEXYL)PHTHALATE	<5
CHRYSENE	<5
DI-N-OCTYLPHTHALATE	<5
BENZO(b)FLUORANTHENE	<5
BENZO(k)FLUORANTHENE	<5
BENZO(a)PYRENE	<5
DIBENZO(a,h)ANTHRACENE	<5
BENZENETHIOL	<5
DIBENZO(A,J)ACRIDINE	<5 *
7,12-DIMETHYLBENZ(a)ANTHRACENE	<5
INDENE	<5
METHYLCHRYSENE	<5
1-METHYLNAPHTHALENE	<5
3-METHYLPHENOL	<5
PYRIDINE	<5
QUINOLINE	<25

* ESTIMATED PRACTICAL QUANTITATION LIMIT BASED ON A REVIEW OF THE MASS SPECTRA DATA.

Analytical Technologies, Inc.

TEST : SEMI-VOLATILE ORGANICS (SKINNER LIST) EPA 8270

ATI I.D. : 10551001

COMPOUNDS	RESULTS
SURROGATE PERCENT RECOVERIES	
NITROBENZENE-D5 (%)	42
2-FLUOROBIPHENYL (%)	46
TERPHENYL (%)	92
PHENOL-D6 (%)	38
2-FLUOROPHENOL (%)	51
2,4,6-TRIBROMOPHENOL (%)	44

WATER SAMPLES

PHASE II, RFI 1991
GIANT REFINING
CINIZA

METALS

PARAMETER	UNITS	MW-4	OW-1	OW-2	OW-5	OW-7	OW-9	OW-10	OW-30*	EQUIP WASH(1)	EQUIP WASH(2)
Arsenic	mg/l	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	mg/l	0.024	0.128	0.497	0.085	0.067	0.044	0.081	0.130	<0.010	<0.057
Beryllium	mg/l	<0.005	<0.005	0.007	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium	mg/l	<0.005	0.006	<0.005	<0.025	<0.005	<0.005	0.013	<0.005	<0.005	<0.005
Cobalt	mg/l	<0.010	<0.010	<0.010	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chromium	mg/l	<0.010	<0.010	0.023	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Copper	mg/l	0.379	0.017	0.044	<0.050	0.018	0.014	<0.010	0.019	<0.010	0.017
Mercury	mg/l	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Potassium	mg/l	1.4	2.6	2.7	7.9	2.0	1.0	1.8	2.2	<1.0	<1.0
Nickel	mg/l	<0.020	<0.020	<0.020	<0.10	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Lead	mg/l	0.0002	0.008	0.026	0.0021	0.0003	0.0002	<0.0002	<0.0002	<0.002	<0.002
Antimony	mg/l	<0.05	<0.05	<0.05	<0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Selenium	mg/l	<0.005	0.007	<0.010	<0.05	<0.005	0.013	0.024	0.007	<0.005	<0.005
Vanadium	mg/l	<0.010	0.050	0.051	<0.50	0.024	0.012	<0.010	0.051	<0.010	<0.010
Zinc	mg/l	0.038	0.033	0.063	<0.05	0.015	0.023	0.012	0.036	0.012	0.014

* Duplicate sample of OW-1.
(1) Equipment wash of OW-1.
(2) Equipment wash of OW-2

WATER SAMPLES

PHASE II, RFI 1991
GIANT REFINING
CINIZA

PARAMETER	UNITS	MW-4	OW-1	OW-2	OW-5	OW-7	OW-9	OW-10	OW-30*	EQUIP WASH(1)	EQUIP WASH(2)
pH	---	8.77	8.86	8.5	6.98	8.87	8.48	8.36	8.85	5.79	5.79

* Duplicate sample of OW-1.
(1) Equipment wash of OW-1.
(2) Equipment wash of OW-2

8240 VOLATILE ORGANIC

PARAMETER	UNITS	MW-4	OW-1	OW-2	OW-5	OW-7	OW-9	OW-10	OW-30*	EQUIP WASH(1)	EQUIP WASH(2)
Carbon Disulfide	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichlorethane	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Butanone (MEK)	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Chloroethylvinylether	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chlorobenzene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ethybenzene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Styrene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Xylenes	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,4-Dioxane	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,2-Dibromoethane (EDB)	ug/l	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5

* Duplicate sample of OW-1.
(1) Equipment wash of OW-1.
(2) Equipment wash of OW-2

Duplicate

8270 SEMI-VOLATILE ORGANICS

PARAMETER	UNITS	MW-4	OW-1	OW-2	OW-5	OW-7	OW-9	OW-10	OW-30*	EQUIP WASH(1)	EQUIP WASH(2)
Phenol	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,4-Dichlorobenzene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichlorobenzene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Methylphenol	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4-Methylphenol	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2,4-Dimethylphenol	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Naphthalene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dimethylphthalate	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2,4-Dinitrophenol	ug/l	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
4-Nitrophenol	ug/l	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
Diethylphthalate	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Phenanthrene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Anthracene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Di-n-butylphthalate	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Flouranthene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Pyrene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Butylbenzylphthalate	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzo(a)anthracene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bis(2-ethylhexyl)phthalate	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chrysene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Di-n-octylphthalate	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzo(b)flouranthene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzo(k)flouranthene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzo(a)pyrene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dibenzo(a,h)anthracene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Benzenethiol	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dibenzo(a,j)acridine	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
7,12-Dimethylbenz(a) Anthracene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Indene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylchrysene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1-Methylnaphthalene	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
3-Methylphenol	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Pyridine	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Quinoline	ug/l	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25

* Duplicate sample of OW-1.
(1) Equipment wash of OW-1.
(2) Equipment wash of OW-2

BORING OW-5

SURFACE ELEVATION: 6882 FEET

LABORATORY TEST DATA

DEPTH IN FEET	TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	STRENGTH TEST DATA: DEVIATOR STRESS (PSF)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)
0									
10									
20									
30									
40									
50									
60									
70									
80									
90									
100									
110									
120									
130									
140									
150									
160									

PENETRATION RATE MINUTES/FOOT	SYMBOLS	DESCRIPTION
0.8	ML	TRIASSIC PERIOD
		CHINLE FORMATION
3.4	CL	BROWN TO REDDISH BROWN FINE SAND WITH SOME SILT AND CLAY, SOFT, HIGHLY WEATHERED
3.0		3.5 FEET: REDDISH BROWN SILTY CLAY, SOFT, HIGHLY WEATHERED
1.6		GRADES WITH GRAVEL-SIZED FRAGMENTS OF SANDSTONE AND LIMESTONE FROM 15 TO 25 FEET
1.4		
2.0		
2.3		
4.0		
2.5		
3.3	SHALE	48 FEET: SHALE, REDDISH BROWN, SILTY, WITH SOME SAND, SOFT, FRESH
3.2		GRADES WITH OCCASIONAL THIN INTERBEDS OF SANDSTONE AND LIMESTONE FROM 55 FEET
4.5		
3.8		
3.6		
4.0		
4.0	SS	82 FEET: SANDSTONE, REDDISH BROWN, VERY FINE-GRAINED, INTERBEDS OF WHITE TO GRAY FINE GRAINED SANDSTONE, SOME MICA, SOFT, FRESH
5.0		
4.2		

BORING COMPLETED AT 92.0 FEET ON 11/12/80.
BORING CAVED FROM 25.3 TO 92.0 FEET.
[redacted]

?

LOG OF BORINGS

DAMES & MOORE

nologies, Inc. 9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. 105510

.ny

: RFI

osendale

ical Technologies, Inc. received a request to
ple(s). The sample(s) were analyzed with EPA
valent methods. The results of these analyses
trol data, which follow each set of analyses,

rix interferences for several metals (excluding
ury) analyses. These samples had to be diluted
tection limits have been raised accordingly.

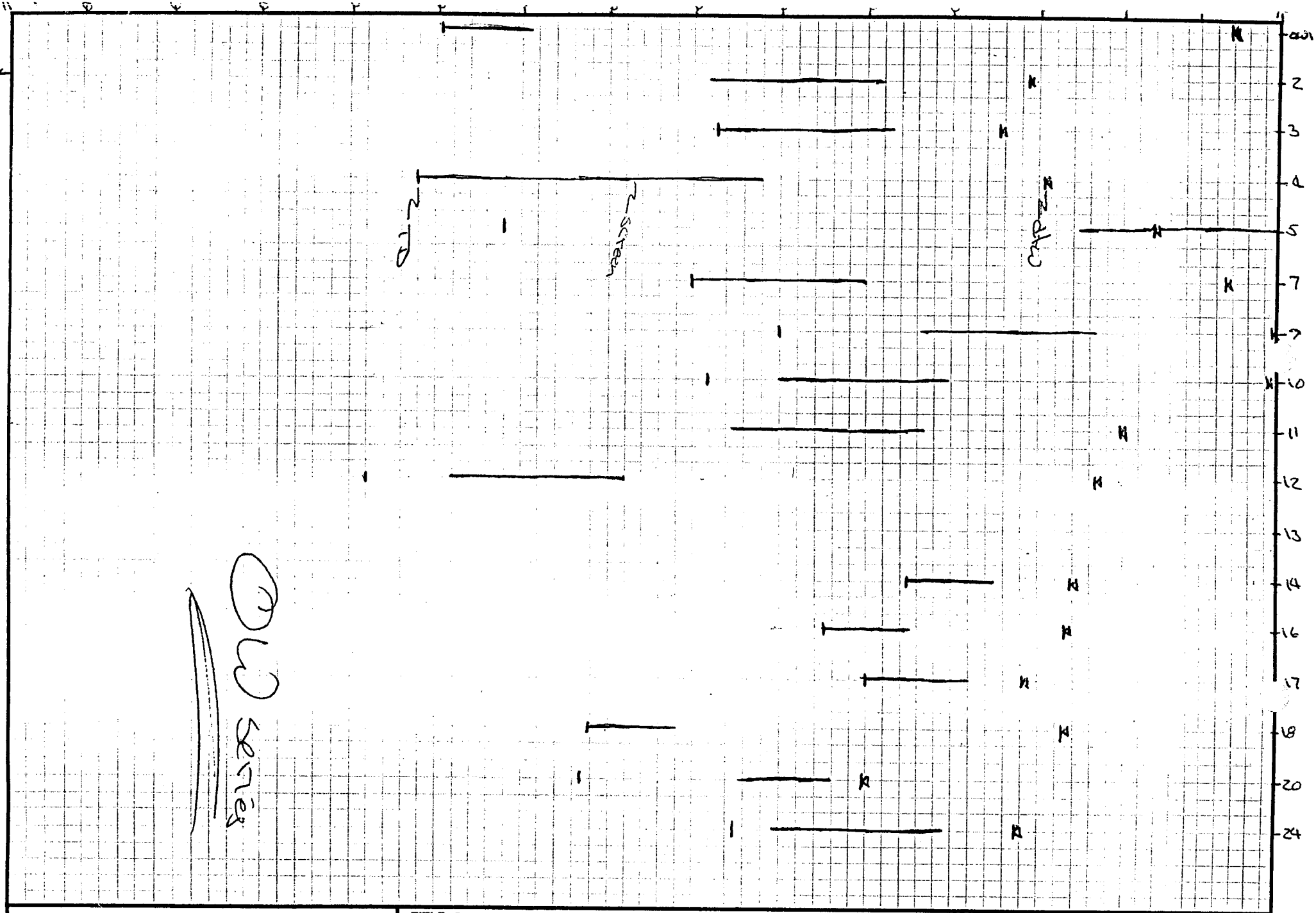
stions or comments, please do not hesitate to
496-4400.

Robert V. Woods

Robert V. Woods
Laboratory Manager

ger

Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-914



Continental Environmental Services

TITLE From GTRF 06E
Geoscience Consultants Y86
Table 3-1

1 screen
2 dtw
— TD

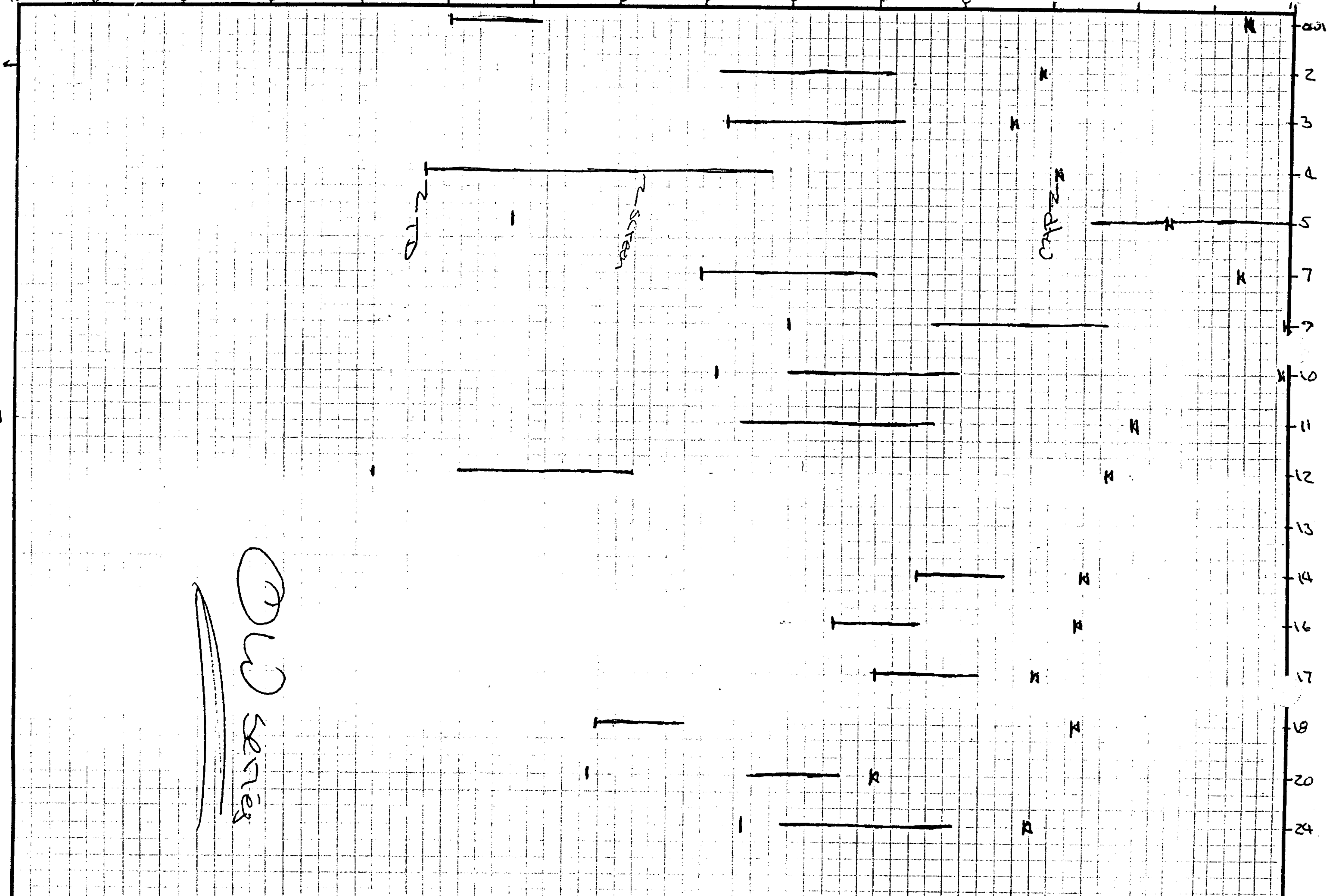
OW series

SCALE:

DATE:

REVISION:

LITEP0811



Continental Environmental Services

TITLE from GTRF OGE Geoscience Consultants Y86 Table 3-1

| screen
≥ dtw
— TD

OW series

SCALE:

DATE:

REVISION:

LITEP0811

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Shell Oil Company Owner's Well No. OW-5
Street or Post Office Address Box 7, Route 3
City and State Gallup, NM

Well was drilled under Permit No. G-37-0-1 and is located in the:

a. ____ ¼ ____ ¼ NE ¼ NW ¼ of Section 33 Township 15N Range 15W N.M.P.M.

b. Tract No. ____ of Map No. ____ of the ____

c. Lot No. ____ of Block No. ____ of the ____
Subdivision, recorded in ____ County.

d. X= ____ feet, Y= ____ feet, N.M. Coordinate System ____ Zone in the ____ Grant.

(B) Drilling Contractor Gallup Drilling, Inc. License No. WD 731

Address P.O. Box 969, Gallup, NM 87301

Drilling Began 11/10/80 Completed 11/12/80 Type tools Cable Size of hole 10 in.

Elevation of land surface or ____ at well is 6882 ft. Total depth of well 92 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 16.4 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
82	92	52	Fine-Grained sandstone	<1

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
4	PVC	–	0	25.3	25.3	–	0	25.3
			(Gravel	pack 17.4	to 25.3 feet)			

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				
0	17.4	10		7.83	Poured from surface
25.3	92	10	Cave		

Section 5. PLUGGING RECORD

Plugging Contractor Will be plugged when use as
Address monitoring well is terminated
Plugging Method
Date Well Plugged
Plugging approved by:

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received

Quad ____ FWL ____ FSL ____

File No. ____ Use ____ Location No. ____

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	3.5	3.5	Brown to red-brown clayey silty sands
3.5	15	11.5	Red-brown silty clay
15	25	10	Red-brown silty clay with coarse to gravel size sands
25	48	23	Red-brown fine sandy, silty clay
48	55.5	7.5	Red-brown weak silty shale
55.5	82	26.5	Red-brown silty shale with layers of coarse to gravel size sands
82	92	10	Red-brown very fine grained sandstone, weak, silica, cementation, alternating with layers of white to gray fine grained sandstone, weak, silica cementation, composed mostly of quartz with some micas.

Section 7. REMARKS AND ADDITIONAL INFORMATION

Water table difficult to determine.

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

William E. Mead

~~Owner~~ Project Manager

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

APPENDIX A

WELL CLOSEOUT RECOMMENDATIONS - CINIZA REFINERY

WELL I.D.	(YES/NO)	RATIONALE
OW-1	NO	Well monitors the Sonsela at the western edge of the property. Well is artesian flowing. Recommend adding pressure cap.
OW-2	YES	Well drilled to the Sonsela (143'), backfilled with cuttings, gravel packed and screened from 43'-68'. Potential for communication between upper water bearing zone and Sonsela considered high. Log questionable; location of upper water bearing zone not known.
OW-3	YES	Suspect poor logging. Location of water bearing zone not known. Well screened and gravel packed from 36'-67'. Believe water bearing interval is a very thin zone at approximately 67' based on recent data. This zone may add water to otherwise dry sandy zones above.
OW-4	YES	Located in the center of the land treatment unit. Logs indicate that the well is screened in the Sonsela and likely is gravel packed across other water bearing units above, creating the potential for cross contamination. Logging questionable.
OW-5	CLOSED	This well was closed in 1996 after it was observed screen used in construction of the well was exposed at the ground surface.
OW-7	YES	Water producing zone is not known. Screen and gravel pack extends 25'. It is believed that the well produces from zone on Chinle plus sands above - 2 distinct zones. Zones should not be allowed to intermix. Located in a low water area and floods during rainy season.
OW-9	YES	This well is located in the Sonsela. Gravel extends into the alluvial material above the sandstone. Potentially cross contamination can occur between Sonsela water and water in the alluvial materials above. The well is also located in a standing water area and is subject to flooding.
OW-10	YES	Well appears to be sound but is located in area subject to surface flooding.
OW-11	YES	Used as the up gradient well for monitoring water coming into the facility. The location of the well is not truly up gradient of the facility. Recommend replacing this well with a well that is up gradient of the facility. Well is screened below the producing zone. Well was originally drilled to 150+feet, backfilled with cuttings then screened. Water producing zone can be cross contaminated with material below the actual production zone.

Continue

American Environmental Network, Inc.

AEN I.D. 805378

OW 7

June 12, 1998

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name (none)
Project Number (none)

Attention: STEVE MORRIS

On 5/20/98 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 8260 was performed by American Environmental Network (NM) Inc., Albuquerque, NM.

All other parameters were performed by American Environmental Network (FL) Inc., Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network (NM), Inc.

CHAIN OF CUSTODY

DATE 5-14-98 PAGE: 1 OF 1

AEN(NM) Accession # [illegible]

SHADED AREAS ARE FOR LAB USE ONLY

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co./Cinizo
COMPANY: Same
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:	8270 Semi Vols	8260 BTEX	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:
OW-7-51898	5/18/98	0945	H_2O																				X	X					
OW-10-51898	5/18/98	1010	"																				X	X					

PROJECT INFORMATION

PROJ NO.
PROJ NAME
PO NO
SHIPPED VIA

SAMPLE RECEIPT

NO. CONTAINERS	10
CUSTODY SEALS	0/N/NA
RECEIVED INTACT	Y/N
BLUE ICE/ICE	2°C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) [ ] 24hr [ ] 48hr [ ] 72hr [ ] 1 WEEK (NORMAL) [ ]

CERTIFICATION REQUIRED: [ ] NM [ ] SDWA [ ] OTHER

METHANOL PRESERVATION [ ]

COMMENTS: FIXED FEE [ ]

1998 Annual Groundwater sample

RELINQUISHED BY:	RELINQUISHED BY:
Signature: Time: 0900	Signature: Time:
Printed Name: Steve Morris Date: 5/19/98	Printed Name: Date:
Company: Giant	Company:

RECEIVED BY:	RECEIVED BY (LAB):
Signature: Time:	Signature: Time: [illegible]
Printed Name: Date:	Printed Name: Date: [illegible]
Company:	American Environmental Network (NM) Inc.

DISTRIBUTION: White - AEN, Canary - Originator

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805378
PROJECT #	: (none)	DATE RECEIVED :	5/20/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805378-01	OW-7-51898	AQUEOUS	5/18/98	N/A	05/21/98	1

PARAMETER	DET. LIMIT		UNITS
Benzene	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY		
1,2-Dichloroethane-d4	110	(80 - 120)
Toluene-d8	105	(88 - 110)
Bromofluorobenzene	101	(86 - 115)

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805378
PROJECT #	: (none)	DATE RECEIVED	: 5/20/98
PROJECT NAME	: (none)	REPORT DATE	:

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-7-51898	AQUEOUS	5/18/98
02	OW-10-51898	AQUEOUS	5/18/98

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805378
PROJECT #	: (none)	DATE RECEIVED :	5/20/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805378-01	OW-7-51898	AQUEOUS	5/18/98	N/A	05/21/98	1

PARAMETER	DET. LIMIT		UNITS
Benzene	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	110 (80 - 120)
Toluene-d8	105 (88 - 110)
Bromofluorobenzene	101 (86 - 115)

CLIENT : AEN-New Mexico

MATRIX: Water

JOB No.: 82359

SEMIVOLATILE ORGANIC ANALYSIS RESULTS

Units: ug/l

Quantitation Factor (QF)	1.00	1.00	1.00			Method Practical Quantitation Limits (PQL)*
Method Blank I.D.	G4670	G4670	G4670			
Lab I.D.	SBLK15746	82359001	82359002			
Client I.D	METHOD BLANK	805378-01	805378-02			
		OW-7-51898	OW-10-51898			
Phenol	U	U	U			10.0
Bis(2-Chloroethyl)Ether	U	U	U			10.0
2-Chlorophenol	U	U	U			10.0
1,3-Dichlorobenzene	U	U	U			10.0
1,4-Dichlorobenzene	U	U	U			10.0
1,2-Dichlorobenzene	U	U	U			10.0
2-Methylphenol	U	U	U			10.0
2,2'-Oxybis(1-Chloropropane)	U	U	U			10.0
4-Methylphenol	U	U	U			10.0
N-Nitrosodi-n-Propylamine	U	U	U			10.0
Hexachloroethane	U	U	U			10.0
Nitrobenzene	U	U	U			10.0
Isophorone	U	U	U			10.0
2-Nitrophenol	U	U	U			10.0
2,4-Dimethylphenol	U	U	U			10.0
Bis(2-Chloroethoxy) Methane	U	U	U			10.0
2,4-Dichlorophenol	U	U	U			10.0
1,2,4-Trichlorobenzene	U	U	U			10.0
Naphthalene	U	U	U			10.0
4-Chloroaniline	U	U	U			10.0
Hexachlorobutadiene	U	U	U			10.0
4-Chloro-3-Methylphenol	U	U	U			10.0
2-Methylnaphthalene	U	U	U			10.0
Hexachlorocyclopentadiene	U	U	U			10.0
2,4,6-Trichlorophenol	U	U	U			10.0
2,4,5-Trichlorophenol	U	U	U			50.0
2-Chloronaphthalene	U	U	U			10.0
2-Nitroaniline	U	U	U			50.0
Dimethylphthalate	U	U	U			10.0
Acenaphthylene	U	U	U			10.0
2,6-Dinitrotoluene	U	U	U			10.0
3-Nitroaniline	U	U	U			50.0
Acenaphthene	U	U	U			10.0
2,4-Dinitrophenol	U	U	U			50.0
4-Nitrophenol	U	U	U			50.0

* Sample PQL (Practical Quantitation Limit) = Method PQL X QF

CLIENT : AEN-New Mexico

MATRIX: Water

JOB No.: 82359

SEMIVOLATILE ORGANIC ANALYSIS RESULTS

Units: ug/l

Quantitation Factor (QF)	1.00	1.00	1.00			Method Practical Quantitation Limits (PQL)*
Method Blank I.D.	G4670	G4670	G4670			
Lab I.D.	SBLK15746	82359001	82359002			
Client I.D	METHOD BLANK	805378-01	805378-02			
		OW-7-51898	OW-10-51898			
Dibenzofuran	U	U	U			10.0
2,4-Dinitrotoluene	U	U	U			10.0
Diethylphthalate	U	U	U			10.0
4-Chlorophenyl-Phenyl Ether	U	U	U			10.0
Fluorene	U	U	U			10.0
4-Nitroaniline	U	U	U			50.0
4,6-Dinitro-2-Methylphenol	U	U	U			50.0
N-Nitrosodiphenylamine (1)	U	U	U			10.0
4-Bromophenyl-Phenylether	U	U	U			10.0
Hexachlorobenzene	U	U	U			10.0
Pentachlorophenol	U	U	U			50.0
Phenanthrene	U	U	2J			10.0
Anthracene	U	U	U			10.0
Carbazole	U	U	U			10.0
Di-n-Butylphthalate	U	U	U			10.0
Fluoranthene	U	U	3J			10.0
Pyrene	U	U	2J			10.0
Butylbenzylphthalate	U	U	U			10.0
3,3'-Dichlorobenzidine	U	U	U			10.0
Benzo(a)Anthracene	U	U	1J			10.0
Chrysene	U	U	U			10.0
Bis(2-Ethylhexyl)Phthalate	U	U	U			10.0
Di-n-Octylphthalate	U	U	U			10.0
Benzo(b)Fluoranthene	U	U	1J			10.0
Benzo(k)Fluoranthene	U	U	U			10.0
Benzo(a)Pyrene	U	U	U			10.0
Indeno(1,2,3-cd)Pyrene	U	U	U			10.0
Dibenz(a,h)Anthracene	U	U	U			10.0
Benzo(g,h,i)Perylene	U	U	U			10.0

* Sample PQL (Practical Quantitation Limit) = Method PQL X QF

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805378
PROJECT #	: (none)		
PROJECT NAME	: (none)		

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	052198	AQUEOUS	N/A	05/21/98	1

PARAMETER	DET. LIMIT		UNITS
1,1-Dichloroethene	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	105 (80 - 120)
Toluene-d8	99 (88 - 110)
Bromofluorobenzene	94 (86 - 115)

American Environmental Network, Inc.

Spike Recovery and RPD Summary Report - WATER

Method : C:\HPCHEM\1\METHODS\82600310.M (RTE Integrator)
Title : AEN New Mexico GC/MS
Last Update : Tue May 12 14:39:09 1998
Response via : Initial Calibration

Non-Spiked Sample: 05219811.D

	Spike Sample	Spike Duplicate Sample
File ID :	052198S1.D	052198S2.D
Sample :	805377-04 MS	805377-04 MS
Acq Time:	21 May 98 4:56 pm	21 May 98 5:32 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-Dichloroethene	0.0	50	48	48	97	96	1	14	61-145
Benzene	0.0	50	50	50	101	101	0	11	76-127
Trichloroethene	0.0	50	50	50	101	99	1	14	71-120
Toluene	0.0	50	50	48	99	96	3	13	76-125
ılorobenzene	0.0	50	48	47	95	94	1	13	75-130

- Fails Limit Check

82600310.M Fri May 29 12:04:59 1998

American Environmental Network
628 Route 10 • Whippany, NJ 07981 • (973) 428-8181 • Fax (973) 428-5222

REPORT TRANSMITTAL

JUNE 10, 1998

AEN-NEW MEXICO

Project: GIANT REFINING COMPANY/805378

PREPARED BY:

AMERICAN ENVIRONMENTAL NETWORK INC.

(CERTIFICATION NUMBER 14530)

AEN JOB No. 20980-82359

VOLUME 1 of 1

JUNE 10, 1998

20980-82359
AEN-NEW MEXICO
2709-D PAN AMERICAN FREEWAY, N.E.
ALBUQUERQUE , NM 87107

ATTENTION: K.MCNEILL

The following samples were received for analysis by AEN-NJ (Cert.#14530). These samples were received on and labeled as follows:

AEN Sample No.:	Client ID:	Date Received
82359001	805378-01	05/21/98
82359002	805378-02	05/21/98

DATA RELEASE AUTHORIZED BY: Brian Wood

Brian W. Wood
Director of Operations

AEN-NJ Lab Certifications

AEN-NJ possesses the following regulatory certifications and is currently certified to perform analysis in accordance with regulations pertaining to these certifications. Certificates are on file at the laboratory.

State/Agency Certification	Lab ID Number
CLP Organics Contract	68D50011
Connecticut	PH0722
Maryland	195
New Jersey	14530
New York	10997
North Carolina	339
Pennsylvania	68-355
Rhode Island	178
West Virginia	258
USDA Permit	S-3295 Revised
Delaware	NJ323

Last updated: 3/24/98

CHAIN OF CUSTODY

AMEF N ENVIRONMENTAL NETWORK
Albuque e, New Mexico

Interlab C ain of Custody

DATE: 5/20/98 PAGE. OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: AMERICAN ENVIRONMENTAL NETWORK
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

82359

CLIENT PROJECT MANAGER:

Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
805378-01	5/18	0945	AQ	001																	X	X											
-02	↓	1010	↓	002																													

PROJECT INFORMATION	
PROJECT NUMBER:	805378
PROJECT NAME:	Giant Refining Co.
QC LEVEL:	(STD.) IV
QC REQUIRED:	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 6/2
RUSH SURCHARGE:
CLIENT DISCOUNT:
SPECIAL CERTIFICATION REQUIRED: ☐YES ☐NO

SAMPLES SENT TO:	
CONNECTICUT	
ILLINOIS	
MASSACHUSETTS	
PENSACOLA	
PORTLAND	
PHOENIX	
N.CAROLINA	
New Jersey	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Francine Torivio Time: 1705	Signature: Time:
Printed Name: Francine Torivio Date: 5/20/98	Printed Name: Date:
Albuquerque	Company:
RECEIVED BY: 1.	RECEIVED BY: (LAB)
Signature: Time:	Signature: Time: 1000
Printed Name: Date:	Printed Name: Date: 5/21/98
Company:	Company:

METHODOLOGY REVIEW

ANALYSES	METHOD NUMBER
SEMIVOLATILES	SW846 3510A/8270B

ORGANICS ANALYSIS
DATA AND SAMPLE QUALIFIERS

DATA QUALIFIERS:

U - Indicates that the compound was analyzed for but not detected.

J - This qualifier indicates an estimated concentration. This qualifier is used (1) when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL or PQL but greater than zero, and (3) when the retention time data indicate the presence of a compound that meets the Pesticide/Aroclor identification criteria, and the result is less than the CRQL or PQL but greater than zero.

B - This qualifier is used when the analyte is found in a method blank as well as the sample. It indicates possible sample contamination and warns the user to use caution when applying the results of this analyte.

E - Exceeds calibration curve

A - Indicates that a tentatively identified compound is a suspected Aldol-condensation product.

N - Indicates presumptive evidence of a compound. This qualifier is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all tentatively identified compound results. For generic classification of a tentatively identified compound, such as chlorinated hydrocarbon, the N code is not used.

D - This qualifier identifies all compounds identified in an analysis at a secondary dilution factor.

P - Indicates that the quantitative results from the two GC columns differed by more than 25 percent.

SAMPLE QUALIFIERS:

DL - Indicates that the analysis was performed at a secondary dilution.

RE - Rerun - Indicates that the analysis is a reinjection or a reextraction and reanalysis, usually due to a failed QC element in the initial analysis.

LABORATORY CHRONICLE

AEN, Inc. - NEW JERSEY
SAMPLE RECEIPT VERIFICATION FORM

NUMBER: 82359 CLIENT NM DATE RECEIVED: 5/21/98

OF SAMPLES 2 # OF COOLERS 1
CUSTODY SEALS: PRESENT/ ABSENT INTACT/ BROKEN TEMPERATURE BLANK PRESENT: _YES ✓ NO

COOLER TEMP/S ° C 5.0 _____ _____ COOLER OUTSIDE 2- 6 ° C ___ PRESERVED: ICE/BLUE ICE/ NONE
IF OUTSIDE TEMP RANGE - WERE SAMPLES RECEIVED LESS THAN 4 HOURS FROM COLLECTION ? ___ YES ___ NO

CHAIN OF CUSTODY: PRESENT/ ABSENT PROPERLY SIGNED, DATED, TIME: _YES _ NO
SAMPLE TAGS: PRESENT/ ABSENT RECEIVED BY: DRIVER ____ IF SHIPPED AIRBILL PRESENT ___ # ____

COOLER RADIOACT. SCREEN BELOW *0.50 uR/hr* YES ___ NO ___ (INFORM SAFETY OFFICER IMMED.)
✓ YES __ NO SAMPLE BOTTLES INTACT
✓ YES __ NO PROPER CONTAINERS PER ANALYSIS USED
✓ YES __ NO SAMPLE LABELS INTACT
✓ YES __ NO LABELS COMPLETE AND LEGIBLE (ID, DATE,TIME,SIGNATURE,PRESERVATIVE)
✓ YES __ NO SAMPLES RECEIVED WITHIN HOLDING TIME
✓ YES __ NO SAMPLES PROPERLY PRESERVED
✓ YES __ NO NO BUBBLES PRESENT VOA WATER MATRIX ✓ NA
✓ YES __ NO SUFFICIENT SAMPLE VOLUME RECEIVED

_____ INTIAL _____ DATE - RUSH REPORT ISSUED BY ✓ NA
_____ INTIAL _____ DATE - pH ANALYSIS PERFORMED BY ✓ NA
_____ INTIAL _____ DATE - % MOISTURE PERFORMED BY ✓ NA
_____ INTIAL _____ DATE - SAMPLE COMPOSITE PERFORMED BY ✓ NA

NOTE AND ITEMIZE BY SAMPLE AFFECTED, DISCREPANCIES AND NONCONFORMANCES FOUND: _____

PROJECT MANAGER INFORMED OF DISCREPANCIES: _____ INTIALS _____ DATE ✓ NA

SUBCONTRACTING OF ANALYSIS REQUIRED __YES __ NO SUB COC COMPLETED __YES __ NO ✓ NA
SUBCONTRACTED SAMPLES SHIPPED __YES __ NO CARRIER USED _____

FINAL INSPECTION

BOTTLES CORRECTLY LABELED ✓ YES __ NO REVIEWED BY [signature]
INTERNAL CHAIN OF CUSTODY INITIATED ✓ YES __ NO
ALL SIGNATURES AND DATES COMPLETE ✓ YES __ NO

VERIFICATION FORM COMPLETE & ACCURATE: SUPERVISOR [signature] DATE 5/21/98
Print name [signature]

CLIENT INFORMED OF DISCREPANCIES/NONCONFORMANCES BY PM _____ DATE ____ TIME ___

NAME CLIENT REPRESENTATIVE INFORMED _____ METHOD: PHONE ___ FAX ___

CORRECTIVE ACTION REQUESTED BY CLIENT: _____

CORRECTIVE ACTION TAKEN: _____

PROJECT MANAGER APPROVED VERIFICATION FORM COMPLETE: [signature] DATE [illegible]
Print name [illegible]

TERNAL CHAIN OF CUSTODY CHRONIC
SAMPLE CONTROL

000039

JOB NUMBER : 82359 DATE RECEIVED : 5/20/98 DATE TO DISPOSE : 7/20/98

PLE CONTROL TECH. ANALYST SAMPLE #/ BOTTLE # / DEPART. / TEST

RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
[illegible]	5/21/98 15:30	[illegible]	5-21-98 1530	001 → 002 - 01 01 BNA
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED
[illegible]	5/21/98 16:00	[illegible]	5-21-98 1600	001, 002 - 01 01

RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED

RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED

RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED

DP 6/8/98

Samples Disposed by _____ Date: _____ Soil Drum # _____ Water Drum # _____
Other : _____ Returned to client (Client Signature) _____ Date _____

AEN, INC. - NEW JERSEY

INTERNAL CHAIN OF CUSTODY CHRONICLE

BNA

JOB/CASE NUMBER: 82359

I confirm that I have performed the analysis below following SOP quidelines:

ANALYSIS:

Sample No(s)	Analyst Signature	Date
001,002	[illegible]	5/22/98

REANALYSIS:

Sample No(s)	Analyst Signature	Date

PREPARATION:

Sample No(s)	Extraction Tech. Signature	Date	Consumed
001, 002	R. Hanson	5-21-98	

I confirm that I have reviewed all associated data for this job:

REVIEWED BY: Signature [illegible] Date 5/26/98

Data Release Authorized By:

AUTHORIZATION: [illegible] Group Leader/Lab Manager — Date 6/11/98

AEN - NEW JERSEY SIGNATURE PAGE

Employee Name	Signature	Initials
REPORTS PRODUCTION		
Berchak, Tina	Tina Berchak	TB
Carman, Jennifer	Jennifer Carman	JC
Cignarella, Christine	[illegible]	[illegible]
Powers, Robert	Robert Powers	RP
Wood, Mary	Mary B. Wood	MBW
BOTTLE PREP		
Cajiao, Joaquin	[illegible]	
D'Achille, Al	[illegible]	AdW
Reynolds, Ed	[illegible]	
Sander, James	[illegible]	JS
SYSTEMS		
Canada, Josh	[illegible]	J.C.
PM		
Brack, Joe	[illegible]	
Coppola, Julianna	Julianna Coppola	J.C
Foschini, Mark	Mark Foschini	MF
Glenn, Dan	[illegible]	DG
Hobart, Paul	[illegible]	PH
ADMINISTRATION		
Gemma, Mike	Michael Gemma	MG
Nadzen, Al	Al Nadzen	
Petretti, Deana	Deana Petretti	DP
Williams, Kirsten	Kirsten Williams	KW

AEN - NEW JERSEY SIGNATURE PAGE

Employee Name	Signature	Initials
SAMPLE CONTROL		
Britton-Fedon, Wendy		
Doeffinger, John		
Droz, Efrain		
LAB DIRECTOR		
Wood, Brian	Brian Wood	
LAB MANAGER		
Gorman, Kevin		KJG
QA/QC MANAGER		
	(INTERIM)	KJG
GC		
Carlone, John		JJC
Herrman, Claus		
Lena, John		
Manlangit, Ferdie		
Scott, Gordon		GDS
Tako, Lisa	Lisa Tako	LT
Waldron, Stacey	Stacey Waldron	SW
GC/MS VOA		
Acierno, Mark		MJA
Klusey, Sylvanus	Sylvanus Klusey	SK
Mauriello, Gregg		GM

AEN - NEW JERSEY SIGNATURE PAGE

Employee Name	Signature	Initials
GC/MS SEMIVOA		
Gustavo, Mato		
Hamernick, Richard		
O'Brien, Patrick		
Pappas, Jerry		
Stanton, Helen		
METALS		
Goudsward, Kevin		
Chang, Grace		GC
Cousineau, Paul		
Lane, Lisa		
Nadzen, Tim		
Patel, Darshana	Darshana Patel	DP
WET CHEMISTRY		
Bussard, Karen		K.M.B.
Florance, Gerard		
Foti, Lisa		
Kenneweg, John		JK
Piatt, Ernest		ERP
FIELD SERVICES		
Knudsen, Troy		
Morgan, Chris		
Murad, John		

REVISED 3/23/98

CONFORMANCE/NON-CONFORMANCE

Client: AEN - NEW MEXICO

Job No: 20980-82359

NONCONFORMANCE SUMMARY

SEMIVOLATILES

No problems were encountered.

SEMIVOLATILES

4B
SEMIVOLATILE METHOD BLANK SUMMARY

SBLK15746

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: G4670

Instrument ID: MSG

Matrix: (soil/water) Water

Level:(low/med) low

Lab Sample ID: SBLK15746

Date Extracted: 05/21/98

Date Analyzed: 05/22/98

Time Analyzed: 10:16

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	805378-01	82359001	G4678	18:17
02	805378-02	82359002	G4679	19:05
03	MW-4-3MSMS	82290005MS	G4687	15:30
04	MW-4-3MSDMSD	82290006MSD	G4688	16:18
05	SBLK15746BS	SBLK15746BS	G4689	17:06
06				
07				
08				
09				
10				
11				
12				
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30				

COMMENTS:

FORM IV SV

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: IEA-NJ

Job No. : 82359

	EPA SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	S7 (2CP) #	S8 (DCB) #	TOT OUT
01	SBLK15746	70	67	56	32	49	67			0
02	805378-01	91	104	66	38	59	74			0
03	805378-02	90	102	63	40	61	76			0
04	MW-4-3MSMS	74	89	61	32	49	105			0
05	MW-4-3MSDMSD	75	90	60	32	51	104			0
06	SBLK15746BS	72	86	59	30	47	97			0
07										
08										
09										
10										
11										
12										
13										
14										
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25										
26										
27										
28										
29										
30										

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl-d14	(33-141)
S4 (PHL)	= Phenol-d5	(10-94)
S5 (2FP)	= 2-Fluorophenol	(21-100)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of QC limits.
D System Monitoring Compound diluted out

FORM II SV-1

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IEA-NJ

Job No. : 82359

Matrix Spike - Client Sample No.: MW-4-3MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	75	0	24	32	12-89
2-Chlorophenol	75	0	54	72	27-123
1,4-Dichlorobenzene	50	0	30	60	36-97
N-Nitroso-di-N-Prop.(1)	50	0	40	80	41-116
1,2,4-Trichlorobenzene	50	0	36	72	39-98
4-Chloro-3-Methylphenol	75	0	61	81	23-97
Acenaphthene	50	0	46	92	46-118
4-Nitrophenol	75	0	30	40	10-80
2,4-Dinitrotoluene	50	0	52	104*	24-96
Pentachlorophenol	75	0	78	104*	9-103
Pyrene	50	0	29	58	26-127

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	75	24	32	0	42	12-89
2-Chlorophenol	75	55	73	1	40	27-123
1,4-Dichlorobenzene	50	31	62	3	28	36-97
N-Nitroso-di-N-Prop.(1)	50	39	78	2	38	41-116
1,2,4-Trichlorobenzene	50	36	72	0	28	39-98
4-Chloro-3-Methylphenol	75	62	83	2	42	23-97
Acenaphthene	50	46	92	0	31	46-118
4-Nitrophenol	75	30	40	0	50	10-80
2,4-Dinitrotoluene	50	52	104*	0	38	24-96
Pentachlorophenol	75	78	104*	0	50	9-103
Pyrene	50	28	56	4	31	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.
RPD: 0 out of 11 outside limits
Spike Recovery: 4 out of 22 outside limits
COMMENTS:

3C
WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: IEA-NJ

Job No. : 82359

Matrix Spike - Client Sample No.: SBLK15746BS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	75	0	22	29	12-89
2-Chlorophenol	75	0	52	69	27-123
1,4-Dichlorobenzene	50	0	26	52	36-97
N-Nitroso-di-N-Prop.(1)	50	0	36	72	41-116
1,2,4-Trichlorobenzene	50	0	31	62	39-98
4-Chloro-3-Methylphenol	75	0	58	77	23-97
Acenaphthene	50	0	44	88	46-118
4-Nitrophenol	75	0	26	35	10-80
2,4-Dinitrotoluene	50	0	48	96	24-96
Pentachlorophenol	75	0	64	85	9-103
Pyrene	50	0	27	54	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.

Spike Recovery: 0 out of 11 outside limits

COMMENTS:

FORM III SV-1

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: GG385

DFTPP Injection Date: 05/18/98

Instrument ID: MSG

DFTPP Injection Time: 09:45

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	53.3
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	59.7
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	45.7
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.6
275	10.0 - 30.0 of mass 198	19.7
365	Greater than 1.0% of mass 198	2.3
441	Present, but less than mass 443	9.1
442	Greater than 40.0% of mass 198	63.6
443	17.0 - 23.0% of mass 442	12.2 (19.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050	SSTD050	G4591	05/18/98	10:51
02	SSTD080	SSTD080	G4592	05/18/98	11:41
03	SSTD100	SSTD100	G4593	05/18/98	12:31
04	SSTD120	SSTD120	G4594	05/18/98	13:21
05	SSTD160	SSTD160	G4595	05/18/98	14:11
06	SSTD010	SSTD010	G4596	05/18/98	15:02
07					
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22					

FORM V SV

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: GG392

DFTPP Injection Date: 05/22/98

Instrument ID: MSG

DFTPP Injection Time: 08:24

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	56.1
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	61.7
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	48.1
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.4
275	10.0 - 30.0 of mass 198	26.1
365	Greater than 1.0% of mass 198	3.0
441	Present, but less than mass 443	11.2
442	Greater than 40.0% of mass 198	77.7
443	17.0 - 23.0% of mass 442	15.6 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	G4668	05/22/98	08:41
02	SBLK15746	SBLK15746	G4670	05/22/98	10:16
03	805378-01	82359001	G4678	05/22/98	18:17
04	805378-02	82359002	G4679	05/22/98	19:05
05					
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22					

FORM V SV

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: GG396

DFTPP Injection Date: 05/26/98

Instrument ID: MSG

DFTPP Injection Time: 12:33

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	52.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	58.9
70	Less than 2.0% of mass 69	0.4 (0.6)1
127	40.0 - 60.0% of mass 198	48.6
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.0
275	10.0 - 30.0 of mass 198	21.1
365	Greater than 1.0% of mass 198	3.1
441	Present, but less than mass 443	10.1
442	Greater than 40.0% of mass 198	62.4
443	17.0 - 23.0% of mass 442	13.5 (21.7)2

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	G4686	05/26/98	12:49
02	MW-4-3MSMS	82290005MS	G4687	05/26/98	15:30
03	MW-4-3MSDMSD	82290006MSD	G4688	05/26/98	16:18
04	SBLK15746BS	SBLK15746BS	G4689	05/26/98	17:06
05					
06					
07					
08					
09					
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20					
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22					

FORM V SV

Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4670.D
Acq On : 22 May 98 10:16 am
Sample : MSG;SBLK;
Misc : SBLK15746;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 10:57 1998

Vial: 4
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	9.59	152	253501	40.00 ppb	0.00
20) Naphthalene-d8	12.76	136	989837	40.00 ppb	-0.02
35) Acenaphthene-d10	17.33	164	683367	40.00 ppb	-0.03
56) Phenanthrene-d10	21.24	188	1389539	40.00 ppb	-0.02
68) Chrysene-d12	28.24	240	1802840	40.00 ppb	-0.04
77) Perylene-d12	32.49	264	1633587	40.00 ppb	-0.03
86) 1,4-Dichlorobenzene-d4B	9.59	152	253501	40.00 ppb	0.00
88) Perylene-d12B	32.49	264	1633587	40.00 ppb	-0.03
89) Acenaphthene-d10B	17.33	164	683367	40.00 ppb	-0.03
91) 1,4-Dichlorobenzene-d4C	9.95	152	122517	40.00 ppb	-0.02
94) Acenaphthene-d10C	17.33	164	683367	40.00 ppb	-0.03
96) Naphthalene-d8C	0.00	136	0	0.00 ppb	-14.23
98) Phenanthrene-d10C	21.24	188	1389539	40.00 ppb	-0.02

System Monitoring Compounds					%Recovery
4) 2-Fluorophenol	6.54	112	195991	36.58 ppb	48.77%
5) Phenol-d5	8.69	99	185376	24.14 ppb	32.19%
9) 2-Chlorophenol-d4	9.03	132	363806	53.37 ppb	71.15%
13) 1,2-Dichlorobenzene-d4	9.95	152	122517	26.60 ppb	53.20%
21) Nitrobenzene-d5	10.94	82	276283	35.17 ppb	70.34%
39) 2-Fluorobiphenyl	15.58	172	519094	33.64 ppb	67.28%
59) 2,4,6-Tribromophenol	19.40	332	234325	50.03 ppb	66.70%
71) Terphenyl-d14	25.45	244	1159543	28.23 ppb	56.46%

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

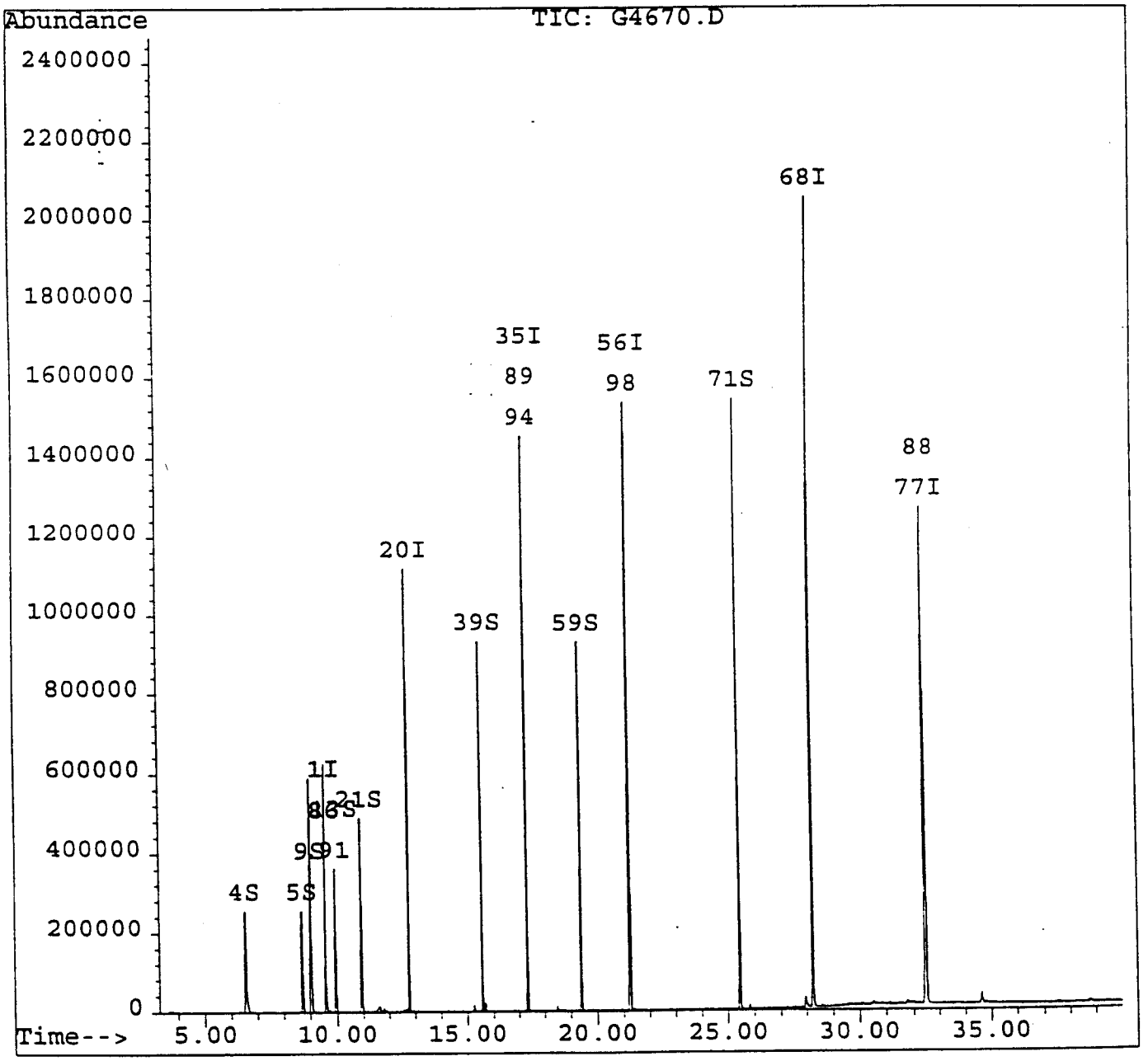
Quantitation Report

000027

Data File : C:\HPCHEM\1\DATA\052298\G4670.D
Acq On : 22 May 98 10:16 am
Sample : MSG;SBLK;
Misc : SBLK15746;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 10:57 1998

Vial: 4
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4678.D
Acq On : 22 May 98 18:17 pm
Sample : MSG;;
Misc : 82359001;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 18:58 1998

Vial: 12
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	9.57	152	264017	40.00 ppb	-0.02
20) Naphthalene-d8	12.76	136	1019255	40.00 ppb	-0.02
35) Acenaphthene-d10	17.33	164	676657	40.00 ppb	-0.03
56) Phenanthrene-d10	21.24	188	1372444	40.00 ppb	-0.02
68) Chrysene-d12	28.23	240	1658722	40.00 ppb	-0.06
77) Perylene-d12	32.46	264	1512846	40.00 ppb	-0.06
86) 1,4-Dichlorobenzene-d4B	9.57	152	264017	40.00 ppb	-0.02
88) Perylene-d12B	32.46	264	1512846	40.00 ppb	-0.06
89) Acenaphthene-d10B	17.33	164	676657	40.00 ppb	-0.03
91) 1,4-Dichlorobenzene-d4C	9.95	152	240093	40.00 ppb	-0.02
94) Acenaphthene-d10C	17.33	164	676657	40.00 ppb	-0.03
96) Naphthalene-d8C	0.00	136	0	0.00 ppb	-14.23
98) Phenanthrene-d10C	21.24	188	1372444	40.00 ppb	-0.02

System Monitoring Compounds					%Recovery
4) 2-Fluorophenol	6.54	112	246394	44.15 ppb	58.87%
5) Phenol-d5	8.67	99	227627	28.46 ppb	37.95%
9) 2-Chlorophenol-d4	9.02	132	457802	64.48 ppb	85.97%
13) 1,2-Dichlorobenzene-d4	9.95	152	240093	50.05 ppb	100.10%
21) Nitrobenzene-d5	10.94	82	368082	45.50 ppb	91.01%
39) 2-Fluorobiphenyl	15.58	172	794900	52.03 ppb	104.05%
59) 2,4,6-Tribromophenol	19.40	332	258080	55.79 ppb	74.38%
71) Terphenyl-d14	25.45	244	1244012	32.92 ppb	65.84%

Target Compounds Qvalue

RA
5-26-98

(#) = qualifier out of range (m) = manual integration

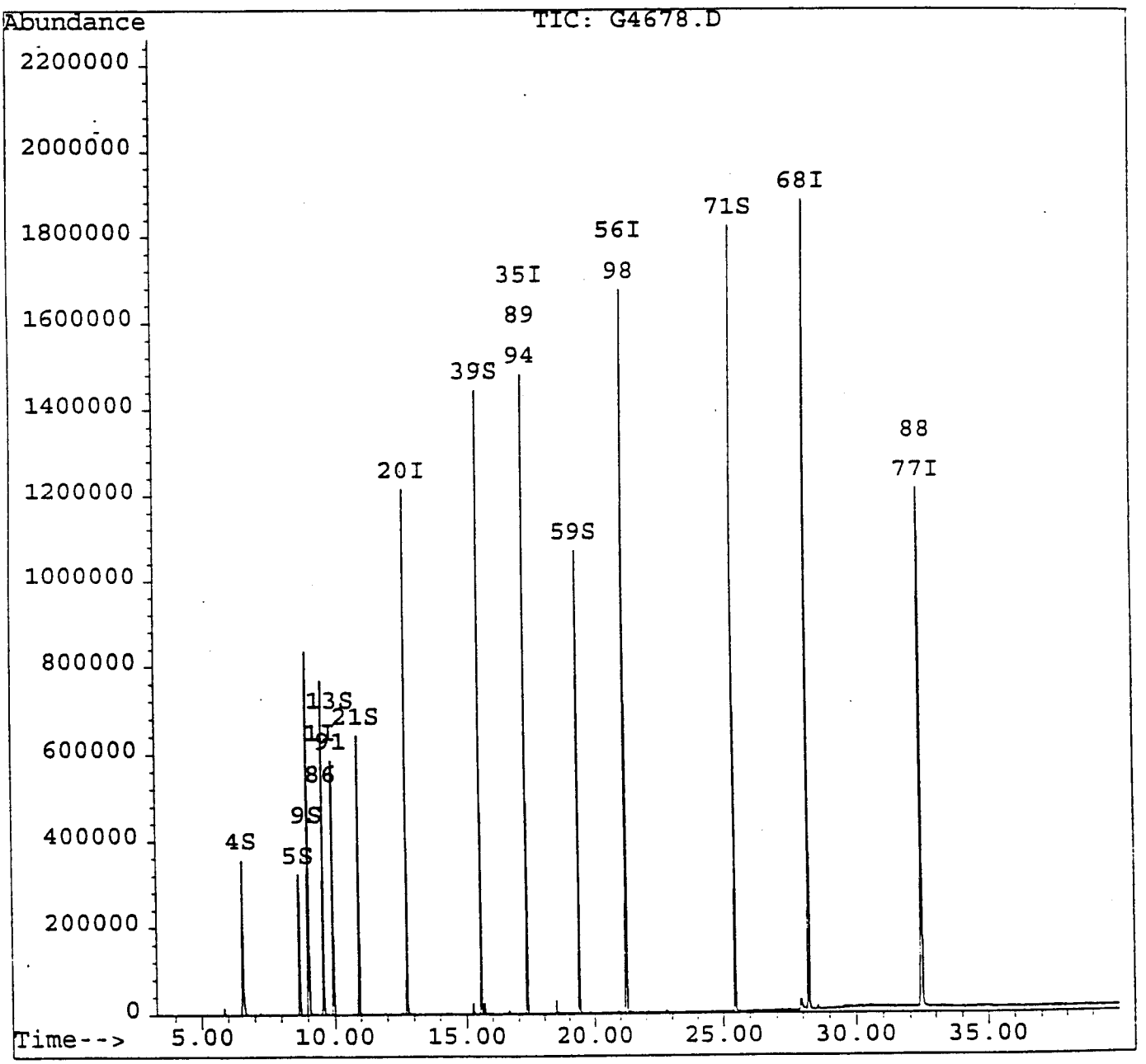
Quantitation Report

000029

Data File : C:\HPCHEM\1\DATA\052298\G4678.D
Acq On : 22 May 98 18:17 pm
Sample : MSG;;
Misc : 82359001;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 18:58 1998

Vial: 12
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4679.D
Acq On : 22 May 98 19:05 pm
Sample : MSG;;
Misc : 82359002;B;WG15746;AQ;;;;LOW;
Quant Time: May 26 11:12 1998

Vial: 13
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	9.57	152	258689	40.00 ppb	-0.02
20) Naphthalene-d8	12.76	136	1010650	40.00 ppb	-0.02
35) Acenaphthene-d10	17.33	164	688585	40.00 ppb	-0.03
56) Phenanthrene-d10	21.24	188	1397536	40.00 ppb	-0.02
68) Chrysene-d12	28.23	240	1547848	40.00 ppb	-0.05
77) Perylene-d12	32.47	264	1880840	40.00 ppb	-0.06
86) 1,4-Dichlorobenzene-d4B	9.57	152	258689	40.00 ppb	-0.02
88) Perylene-d12B	32.47	264	1880840	40.00 ppb	-0.06
89) Acenaphthene-d10B	17.33	164	688585	40.00 ppb	-0.03
91) 1,4-Dichlorobenzene-d4C	9.95	152	235096	40.00 ppb	-0.02
94) Acenaphthene-d10C	17.33	164	688585	40.00 ppb	-0.03
96) Naphthalene-d8C	0.00	136	0	0.00 ppb	-14.23
98) Phenanthrene-d10C	21.24	188	1397536	40.00 ppb	-0.02

System Monitoring Compounds					%Recovery
4) 2-Fluorophenol	6.54	112	250910	45.89 ppb	61.19%
5) Phenol-d5	8.67	99	237974	30.37 ppb	40.49%
9) 2-Chlorophenol-d4	9.02	132	448891	64.53 ppb	86.03%
13) 1,2-Dichlorobenzene-d4	9.95	152	235096	50.02 ppb	100.03%
21) Nitrobenzene-d5	10.94	82	360196	44.91 ppb	89.82%
39) 2-Fluorobiphenyl	15.58	172	794796	51.12 ppb	102.24%
59) 2,4,6-Tribromophenol	19.40	332	268700	57.04 ppb	76.05%
71) Terphenyl-d14	25.46	244	1110619	31.49 ppb	62.99%

Target Compounds						Qvalue
64) Phenanthrene	21.29	178	52963	1.81 ppb		96
67) Fluoranthene	24.42	202	126145	3.42 ppb		82
70) Pyrene	25.03	202	100030	1.97 ppb		86
73) Benzo[a]anthracene	28.20	228	56912	1.16 ppb		86
79) Benzo[b]fluoranthene	31.17	252	54481	1.23 ppb	m	91

RA
5-26-98

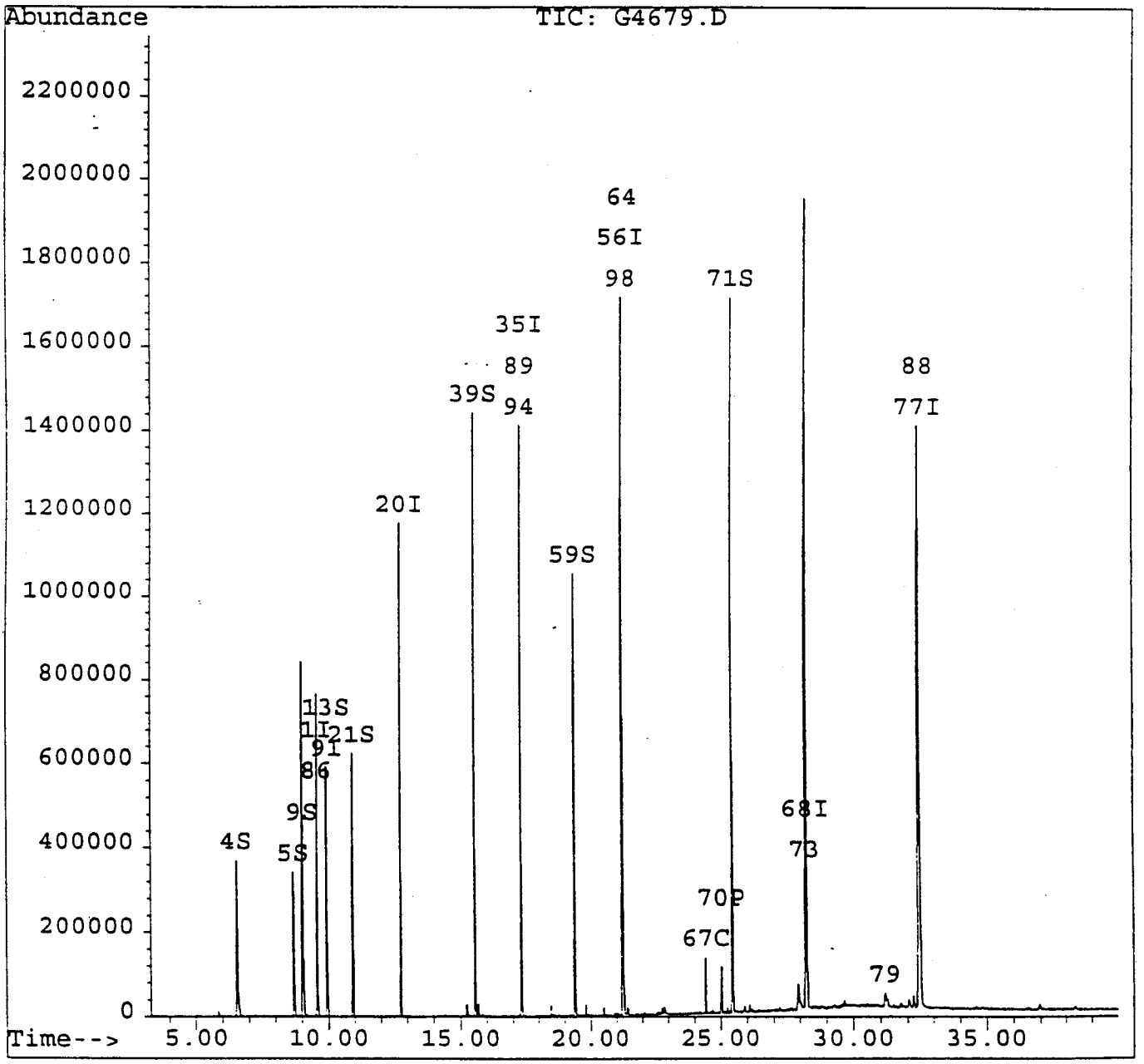
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4679.D
Acq On : 22 May 98 19:05 pm
Sample : MSG;;
Misc : 82359002;B;WG15746;AQ;;;;LOW;
Quant Time: May 26 11:12 1998

Vial: 13
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Multiple Level Calibration



AnalyticalTechnologies,Inc.

2709-D Pan American Freeway, NE Albuquerque, NM 87107
Phone (505) 344-3777 FAX (505) 344-4413

ATI I.D. 602315

OW 9

March 21, 1996

Giant Refining Co.
Route 3, Box 7
Gallup, NM 87301

Project Name/Number: OCD-RE-PERMIT RE-PERMIT SAMP.

Attention: Edward Horst

On 02/08/96, Analytical Technologies, of New Mexico Inc., (ADHS License No. AZ0015), received a request to analyze aqueous samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

The bromide results contained in this report were analyzed within EPA method 300.0 holding and met method criteria; however, it did not meet American Environmental Network (AZ), Inc. criteria (the closing CCV was low). The samples were reanalyzed as follows:

Sample	Result (mg/L)	Date of Analysis
602315-01	<0.3	03/05/96
602315-02	0.6 - OW9	03/08/96
602315-03	<6	03/06/96
602315-04	0.7	03/06/96

The result of the original analysis are considered valid because they met method criteria.

EPA method 601/602 analyses were performed by American Environmental Network (NM) Inc., (formerly Analytical Technologies, Inc), Albuquerque, NM.

EPA method 300.0 (Bromide) and 200.7/6010 (Silica) analyses were performed by American Environmental Network (AZ), Inc., (formerly Analytical Technologies, Inc), 9830 S. 51st Street, Suite B-113, Phoenix, AZ.

EPA method 6010 and 8240 analyses were performed by Analytical Technologies, Inc., 225 Commerce Drive, Fort Collins, CO.

AnalyticalTechnologies,Inc.

All other analyses were performed by American Environmental Network (FL) Inc., (formerly Analytical Technologies, Inc), 11 East Olive Road, Pensacola, FL.

EPA method 610 analyses were cancelled on 02/08/96 for sample "012996-01" per Ed Horst.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph.D.
Laboratory Manager

MR:jt

Enclosure

AnalyticalTechnologies of New Mexico, Inc., Albuquerque, NM
San Diego • Phoenix • Seattle • Pensacola • Ft. Collins • Portland • Albuquerque • Anchorage

CHAIN OF CUSTODY

DATE: 2-7-96 PAGE: 1 OF 1

ATI LAB I.D. 602315

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: EDWARD HORST
COMPANY: GIANT REFINING CO
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301
PHONE: 505-722-0227
FAX:

BILL TO: DAVID PAULICK
COMPANY: GIANT REFINING CO
ADDRESS: ROUTE 3, BOX 7
GALLUP, NM 87301

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct/Inject	BROMIDE	(M8015) Gas/Purge & Trap	Gasoline/BTEX & MTBE (M8015/8020)	BTXE/MTBE (8020)	BTEX & Chlorinated Aromatics (602/~~8020~~)	BTEX/MTBE/EDC & EDB (8020/8010/Short)	Chlorinated Hydrocarbons (601/~~8010~~)	SILICA	504 EDB ☐ / DBCP ☐	Polynuclear Aromatics (610/~~8310~~)	Volatile Organics (624/8240) GC/MS	Volatile Organics (8260) GC/MS	GOLD ~~OIL PHASE ITEM 24~~	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral/Acid Compounds GC/MS (625/8270)	General Chemistry			Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)		
020796-01	2-7-96	1103	AQU.	-01			X				X		X	X		X			X				X								
012996-01	1-29-96	1420	AQU	-02			X				X		X	X		X			X				X								
020696-01	2-6-96	1512	AQU	-03			X				X		X	X		X			X				X								
020196-01	2-1-96	1032	AQU.	-04			X				X		X	X		X			X				X								

PROJECT INFORMATION	
PROJ. NO.:	RE-PERMIT BAMP.
PROJ. NAME:	OCD-RE-PERMIT
P.O. NO.:	
SHIPPED VIA:	HAND DELIV
SAMPLE RECEIPT	
NO. CONTAINERS	36
CUSTODY SEALS	Y/N/NA
RECEIVED INTACT	Y
BLUE ICE/ICE	4°C

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒ 2 WEEK

CERTIFICATION REQUIRED: ☐ NM ☐ OTHER SEE BELOW.

METHANOL PRESERVATION ☐

COMMENTS: ONE SET OF SAMPLES WERE TAKEN ON 1-29-96 VOA - MUST BE COMPLETED WITHIN 14 DAYS FROM THAT DATE

RELINQUISHED BY: 1.	RELINQUISHED BY:
Signature: Edward L. Horst Time:	Signature: Steve Morris Time: 10:[illegible]
Printed Name: EDWARD L. HORST Date:	Printed Name: STEVE MORRIS Date: 2/8
Company: GIANT	Company: GIANT
RECEIVED BY: 1.	**RECEIVED BY: (LAB)**
Signature: Steve Morris Time: 1400 hrs	Signature: Andrew Parker Time: 101
Printed Name: STEVE MORRIS Date: 2/7/96	Printed Name: Andrew Parker Date: 2/8
Company: GIANT	Analytical Technologies of New Me.

Analytical Technologies of New Mexico, Inc.
Albuquerque, New Mexico

Interlab Chain of Custody

96-02072 DATE: 2/8 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: Analytical Technologies of New Mexico, Inc.
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)	Item #24: Metals by ICP Gold	→ Al, Sb, As, Ba, Be, B, Cd, Ca, Cr	~~Co~~ Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni	~~Se~~ K, Se, Ag, Na, Tl, V, Zn	Gen Chemistry			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/~~8310~~) Item #5	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta			
601315-01	2/7	1103	AQ	01					X													X											
-02	1/29	1420	↓	02					X																								
-03	2/6	1515	↓	03					X													X											
-04	2/1	1032	↓	04					X													X											

PROJECT INFORMATION	
PROJECT NUMBER:	602315
PROJECT NAME:	OCD Re-Permit
QC LEVEL:	(STD.) IV
QC REQUIRED:	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	10
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./(COLD)	Y
LAB NUMBER	

IWO #: KM 1139

DUE DATE: 2/21
RUSH SURCHARGE: NO
CLIENT DISCOUNT: Quote
SPECIAL CERTIFICATION REQUIRED: ☐ YES ☐ NO

WATCH EXT. TIME

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	X
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	

RELINQUISHED BY: 1.
Signature: Andrew Parker Time: 1700
Printed Name: Andrew Parker Date: 2/8
Analytical Technologies of New Mexico, Inc. Albuquerque

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company: Fedex

RELINQUISHED BY:
Signature: Time:
Printed Name: Date:
Company: Fedex

RECEIVED BY: (LAB)
Signature: Time: 930
Printed Name: Date: 2/9/96
Company: ATCO

Analytical Technologies of New Mexico, Inc. 602264
Albuquerque, New Mexico

Interlab Chain of Custody

~~602246~~ MC 2/9/96

DATE: 2/8 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: Analytical Technologies of New Mexico, Inc.
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry: Item #25 → Fl, Alk, Cl, SO4, TDS, Cation/Anion Balance, pH, Conductivity	Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
601315-01	2/2	1103	AQ	1									X																		
-02	1/29	1420	↓	2									X																		
-03	2/6	1512	↓	3									X																		
-04	2/1	1032	↓	4									X																		

PROJECT INFORMATION	SAMPLE RECEIPT	SAMPLES SENT TO:	RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
PROJECT NUMBER: 601315	TOTAL NUMBER OF CONTAINERS	SAN DIEGO	Signature: Andrew Parker Time: 1700	Signature: Time:
PROJECT NAME: OCD Re-Permit	CHAIN OF CUSTODY SEALS	FT. COLLINS	Printed Name: Andrew Parker Date: 2/8	Printed Name: Date:
QC LEVEL: (STD) IV	INTACT?	RENTON	Analytical Technologies of New Mexico, Inc. Albuquerque	Company:
QC REQUIRED: (MS) MSD BLANK	RECEIVED GOOD COND/COLD	PENSACOLA X	RECEIVED BY: 1.	RECEIVED BY: (LAB) 2.
TAT: (STANDARD) RUSH!	LAB NUMBER ~~602246~~ MC 2/9/96 602264	PORTLAND	Signature: Rolf Elsperman Time: 1029	Signature: Time:
	IWO# KM1141	PHOENIX	Printed Name: R. ELSPERMAN Date: 2/9/96	Printed Name: Date:
DUE DATE: 2/21			Company:	Company:
RUSH SURCHARGE: NO				
CLIENT DISCOUNT: Quote				
SPECIAL CERTIFICATION REQUIRED: ☐YES ☐NO				

AnalyticalTechnologies of New Mexico, Inc.
Albuquerque, New Mexico

Interlab Chain of Custody

DATE: 2/8 PAGE: 1 OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: Analytical Technologies of New Mexico, Inc.
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

CLIENT PROJECT MANAGER: Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry: Silica, Bromide			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta		
2 HS 602315-01	2/7	1103	AQ	1									X																			
-02	1/29	1420		2									X																			
-03	2/6	1512		3									X																			
-04	2/1	1032		4									X																			
-04P																																

PROJECT INFORMATION	
PROJECT NUMBER: 2 HS 602315	
PROJECT NAME: OCD Re-Permit	
QC LEVEL: (STD) IV	
QC REQUIRED: MS MSD BLANK	
TAT: (STANDARD) RUSH!	

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	8
CHAIN OF CUSTODY SEALS	Y
INTACT?	Y
RECEIVED GOOD COND./COLD	Blue
LAB NUMBER	6036666

IWO # KM1143

DUE DATE: 2/21
RUSH SURCHARGE: NO
CLIENT DISCOUNT: Quote
SPECIAL CERTIFICATION REQUIRED: ☐ YES ☐ NO

SAMPLES SENT TO:	
SAN DIEGO	
FT. COLLINS	
RENTON	
PENSACOLA	
PORTLAND	
PHOENIX	X

RELINQUISHED BY: 1.
Signature: Andrew Parker Time: 1700
Printed Name: Andrew Parker Date: 2/8
Analytical Technologies of New Mexico, Inc. Albuquerque

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY:
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB)
Signature: Time: 10
Printed Name: Monica Smith Date: 2/9
Company:

AnalyticalTechnologies,Inc.

CLIENT	:GIANT REFINING CO.	DATE RECEIVED	:02/08/96
PROJECT #	:RE-PERMIT SAMP.		
PROJECT NAME	:OCD-RE-PERMIT	REPORT DATE	:03/21/96

ATI ID: 602315

	ATI ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	602315-01	020796-01 OW-12	AQUEOUS	02/07/96
02	602315-02	012996-01 OW-9	AQUEOUS	01/29/96
03	602315-03	020696-01 OW-14	AQUEOUS	02/06/96
04	602315-04	020196-01 OW-10	AQUEOUS	02/01/96

---TOTALS---

MATRIX	#SAMPLES
AQUEOUS	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 602264
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 602315
Project Name: GIANT
Project Location: OCD-RE-PERMIT
Test: TOTAL ALKALINITY

Client ID:	Lab ID:	Matrix:	Date/Time Sampled:	Date Received:
602315-01	001	WATER	02-FEB-96 1103	09-FEB-96
602315-02	002	WATER	29-JAN-96 1420	09-FEB-96
602315-03	003	WATER	06-FEB-96 1512	09-FEB-96
602315-04	004	WATER	01-FEB-96 1032	09-FEB-96

AnalyticalTechnologies,Inc.

DATE: 03-21-96

ION BALANCE

ATI ACCESSION NUMBER: 602315-02
SAMPLE IDENTIFICATION: 012996-01 (OW-9)
CLIENT: GIANT

ANIONS	RESULT MG/L	FACTOR ME/L	TOTAL
ALKALINITY (AS CACO3)	440.000	0.02000	8.80000
CHLORIDE	220.000	0.02821	6.20620
FLUORIDE	0.600	0.05264	0.03158
NITRATE AS N	NA	0.01613	0.00000
SULFATE	130.000	0.02082	2.70660
		TOTAL ANIONS	17.74438

CATIONS	RESULT	FACTOR	TOTAL
ALUMINUM	<0.2	0.11119	0.00000
CALCIUM	16.000	0.04990	0.7984
POTASSIUM	<1.0	0.02558	0.00000
MAGNESIUM	2.000	0.08229	0.16458
SODIUM	370.000	0.04350	16.09500
COPPER	<0.010	0.03147	0.00000
IRON	<0.1	0.05372	0.00000
MANGANESE	<0.010	0.03640	0.00000
ZINC	<0.02	0.03059	0.00000
		TOTAL CATIONS	17.05798

		%RPD (<10%)		3.94
TOTAL ANIONS/CATIONS	(CALCULATED)	1002.600		
TOTAL DISSOLVED SOLIDS	(ANALYZED)	1000	%RPD (<15%)	0.26
ELECTRICAL COND.		1800	TDS/EC RATIO (0.65+/-0.1)	0.55556

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 602666

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.
PROJECT # : 602315
PROJECT NAME : OCD-RE-PERMIT

DATE RECEIVED : 02/09/96
REPORT DATE : 03/21/96

PARAMETER	UNITS	01	02	03	04
BROMIDE (EPA 300.0)	MG/L	<0.3	0.6	<6	0.7
		(OW-12)	(OW-9)	(OW-14)	(OW-10)

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 602264
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 602315
Project Name: GIANT
Project Location: OCD-RE-PERMIT
Test: TOTAL ALKALINITY

2-9-99

Client Sample Id:	Parameter:	Unit:	Result:
602315-01	ALKALINITY, TOTAL (2320B)	MG/L	360
OW-12	PH (150.1)	UNITS	9.5
	BICARBONATE, CACO3 (2330B)	MG/L	280
	CARBONATE, CACO3 (2330B)	MG/L	82
	HYDROXIDE (2330B) AS CACO3	MG/L	2
602315-02	ALKALINITY, TOTAL (2320B)	MG/L	440
OW-9	PH (150.1)	UNITS	7.7
	BICARBONATE, CACO3 (2330B)	MG/L	440
	CARBONATE, CACO3 (2330B)	MG/L	2
	CARBON DIOXIDE, FREE AS CACO3	MG/L	17
602315-03	ALKALINITY, TOTAL (2320B)	MG/L	630
OW-14	PH (150.1)	UNITS	7.3
	BICARBONATE, CACO3 (2330B)	MG/L	630
	CARBONATE, CACO3 (2330B)	MG/L	1
	CARBON DIOXIDE, FREE AS CACO3	MG/L	63
602315-04	ALKALINITY, TOTAL (2320B)	MG/L	450
OW-10	PH (150.1)	UNITS	7.6
	BICARBONATE, CACO3 (2330B)	MG/L	450
	CARBONATE, CACO3 (2330B)	MG/L	2
	CARBON DIOXIDE, FREE AS CACO3	MG/L	23

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 602264
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 602315
Project Name: GIANT
Project Location: OCD-RE-PERMIT
Test: Group of Single Wetchem

Client ID:	Lab Matrix: ID:	Date/Time Sampled:	Date Received:
602315-01	001 WATER	02-FEB-96 1103	09-FEB-96
602315-02	002 WATER	29-JAN-96 1420	09-FEB-96
602315-03	003 WATER	06-FEB-96 1512	09-FEB-96
602315-04	004 WATER	01-FEB-96 1032	09-FEB-96

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 602264
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 602315
Project Name: GIANT
Project Location: OCD-RE-PERMIT
Test: Group of Single Wetchem

Client Sample Id:	Parameter:	Unit:	Result:
602315-01 OW-12	CHLORIDE (325.3)	MG/L	22
	CONDUCTIVITY (120.1)	UMH/CM	1100
	FLUORIDE (340.2)	MG/L	0.8
	PH (150.1)	UNITS	9.5
	SULFATE (375.4)	MG/L	180
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	690
602315-02 OW-9	CHLORIDE (325.3)	MG/L	220
	CONDUCTIVITY (120.1)	UMH/CM	1800
	FLUORIDE (340.2)	MG/L	0.6
	PH (150.1)	UNITS	7.7
	SULFATE (375.4)	MG/L	130
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	1000
602315-03 OW-14	CHLORIDE (325.3)	MG/L	190
	CONDUCTIVITY (120.1)	UMH/CM	1800
	FLUORIDE (340.2)	MG/L	0.5
	PH (150.1)	UNITS	7.3
	SULFATE (375.4)	MG/L	27
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	1000
602315-04 OW-10	CHLORIDE (325.3)	MG/L	200
	CONDUCTIVITY (120.1)	UMH/CM	1900
	FLUORIDE (340.2)	MG/L	0.5
	PH (150.1)	UNITS	7.6
	SULFATE (375.4)	MG/L	180
	TOTAL DISSOLVED SOLIDS (160.1)	MG/L	1100

AnalyticalTechnologies,Inc.

METALS RESULTS

ATI I.D. : 602666

CLIENT : AMERICAN ENV. NETWORK OF NM, INC.
PROJECT # : 602315
PROJECT NAME : OCD-RE-PERMIT

DATE RECEIVED : 02/09/96
REPORT DATE : 03/21/96

PARAMETER	UNITS	01	02	03	04
SILICA (EPA 200.7/6010)	MG/L	40.2	9.8	13.0	9.8
		OW-12	OW-9	OW-14	OW-10

AnalyticalTechnologies,Inc.

"FINAL REPORT FORMAT - MULTIPLE"

Accession: 602264
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 602315
Project Name: GIANT
Project Location: OCD-RE-PERMIT
Test: Group of Single Metals

Client Id:	Lab Matrix: Id:	Date/Time Sampled:	Date Received:
602315-01	001 WATER	02-FEB-96 1103	09-FEB-96
602315-02	002 WATER	29-JAN-96 1420	09-FEB-96
602315-03	003 WATER	06-FEB-96 1512	09-FEB-96
602315-04	004 WATER	01-FEB-96 1032	09-FEB-96

AnalyticalTechnologies,Inc.

"Method Report Summary"

Accession Number: 602264
Client: ANALYTICAL TECHNOLOGIES, INC.
Project Number: 602315
Project Name: GIANT
Project Location: OCD-RE-PERMIT
Test: Group of Single Metals

Client Sample Id:	Parameter:	Unit:	Result:
602315-01 OW-12	CALCIUM (200.7)	MG/L	3
	MAGNESIUM (200.7)	MG/L	0.2
	SODIUM (200.7)	MG/L	220
	SILICA	MG/L	39
602315-02 OW-9	CALCIUM (200.7)	MG/L	17
	MAGNESIUM (200.7)	MG/L	2.1
	SODIUM (200.7)	MG/L	360
	SILICA	MG/L	9.6
602315-03 OW-14	CALCIUM (200.7)	MG/L	43
	MAGNESIUM (200.7)	MG/L	12
	SODIUM (200.7)	MG/L	340
	SILICA	MG/L	13
602315-04 OW-10	CALCIUM (200.7)	MG/L	23
	MAGNESIUM (200.7)	MG/L	3.0
	SODIUM (200.7)	MG/L	380
	SILICA	MG/L	9.7

TOTAL METALS

AnalyticalTechnologies,Inc.

OW-9

Sample ID

012996 - 01

Lab Name: Analytical Technologies of Colorado, Inc.
Client Name: ATI - NM
Client Project ID: OCD Re-Permit -- 602315
Lab Sample ID: 96-02-072-02

Sample Matrix: Aqueous

Date Collected: 01/29/96
Prep Date: 02/13/96
Date Analyzed: 02/13,14/96

Analyte	Modified Method	Concentration mg/L	Detection Limit mg/L
Aluminum	6010	ND	0.2
Antimony	6010	ND	0.02
Arsenic	6010	ND	0.01
Barium	6010	ND	0.1
Beryllium	6010	ND	0.005
Boron	6010	0.5	0.1
Cadmium	6010	ND	0.005
Calcium	6010	16	1
Chromium	6010	ND	0.01
Cobalt	6010	ND	0.01
Copper	6010	ND	0.01
Iron	6010	ND	0.1
Lead	6010	ND	0.003
Magnesium	6010	2	1
Manganese	6010	ND	0.01
Molybdenum	6010	0.01	0.01
Nickel	6010	ND	0.02
Potassium	6010	ND	1
Selenium	6010	0.006	0.005
Silicon	6010	4.4	0.05
Silver	6010	ND	0.01
Sodium	6010	370	1
Thallium	6010	ND	0.01
Vanadium	6010	ND	0.01
Zinc	6010	ND	0.02

ND = Not Detected

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY RESULTS

TEST : PURGEABLE HALOCARBONS/AROMATICS (EPA 601/602)
CLIENT : GIANT REFINING CO. ATI I.D.: 602315
PROJECT # : RE-PERMIT SAMP.
PROJECT NAME : OCD-RE-PERMIT

SAMPLE ID. #	CLIENT I.D.	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
01	020796-01	AQUEOUS	02/07/96	NA	02/08/96	1
02	012996-01	AQUEOUS	01/29/96	NA	02/08/96	1
03	020696-01	AQUEOUS	02/06/96	NA	02/08/96	1

PARAMETER	UNITS	01	02	03
BENZENE	**UG/L**	<0.5	<0.5	**25**
BROMODICHLOROMETHANE	UG/L	<0.2	<0.2	<0.2
BROMOFORM	UG/L	<0.5	<0.5	<0.5
BROMOMETHANE	UG/L	<1.0	<1.0	<1.0
CARBON TETRACHLORIDE	UG/L	<0.2	<0.2	<0.2
CHLOROBENZENE	UG/L	<0.5	<0.5	<0.5
CHLOROETHANE	UG/L	<0.5	<0.5	<0.5
CHLOROFORM	UG/L	<0.5	<0.5	<0.5
CHLOROMETHANE	UG/L	<1.0	<1.0	<1.0
DIBROMOCHLOROMETHANE	UG/L	<0.2	<0.2	<0.2
1,2-DIBROMOETHANE (EDB)	UG/L	<0.2	<0.2	<0.2
1,2-DICHLOROBENZENE	UG/L	<0.5	<0.5	<0.5
1,3-DICHLOROBENZENE	UG/L	<0.5	<0.5	<0.5
1,4-DICHLOROBENZENE	UG/L	<0.5	<0.5	<0.5
1,1-DICHLOROETHANE	UG/L	<0.3	<0.3	<0.3
1,2-DICHLOROETHANE (EDC)	**UG/L**	<0.5	<0.5	**3.4**
1,1-DICHLOROETHENE	UG/L	<0.2	<0.2	<0.2
CIS-1,2-DICHLOROETHENE	UG/L	<0.2	<0.2	<0.2
TRANS-1,2-DICHLOROETHENE	UG/L	<1.0	<1.0	<1.0
1,2-DICHLOROPROPANE	**UG/L**	<0.2	<0.2	**0.2**
CIS-1,3-DICHLOROPROPENE	UG/L	<0.2	<0.2	<0.2
TRANS-1,3-DICHLOROPROPENE	UG/L	<0.2	<0.2	<0.2
ETHYLBENZENE	**UG/L**	<0.5	<0.5	**2.8**
METHYL-t-BUTYL ETHER	UG/L	<2.5	<2.5	<2.5
METHYLENE CHLORIDE	UG/L	<2.0	<2.0	<2.0
1,1,2,2-TETRACHLOROETHANE	UG/L	<0.2	<0.2	<0.2
TETRACHLOROETHENE	UG/L	<0.5	<0.5	<0.5
TOLUENE	UG/L	<0.5	<0.5	<0.5
1,1,1-TRICHLOROETHANE	UG/L	<1.0	<1.0	<1.0
1,1,2-TRICHLOROETHANE	UG/L	<0.2	<0.2	<0.2
TRICHLOROETHENE	UG/L	<0.3	<0.3	<0.3
TRICHLOROFLUOROMETHANE	UG/L	<0.2	<0.2	<0.2
VINYL CHLORIDE	UG/L	<0.5	<0.5	<0.5
TOTAL XYLENES	**UG/L**	<0.5	<0.5	**1.7**

SURROGATES:

BROMOCHLOROMETHANE (%)	111	104	101
TRIFLUOROTOLUENE (%)	108	97	109

OW-12 OW-9 OW-14

American Environmental Network, Inc.

AEN I.D. 805378

OW 10

June 12, 1998

GIANT REFINING COMPANY
ROUTE 3 BOX 7
GALLUP, NM 87301

Project Name (none)
Project Number (none)

Attention: STEVE MORRIS

On 5/20/98 American Environmental Network (NM), Inc. (ADHS License No. AZ0015), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 8260 was performed by American Environmental Network (NM) Inc., Albuquerque, NM.

All other parameters were performed by American Environmental Network (FL) Inc., Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

Kimberly D. McNeill
Project Manager

H. Mitchell Rubenstein, Ph. D.
General Manager

MR: mt

Enclosure

2709-D Pan American Freeway, NE • Albuquerque, NM 87107 • (505) 344-3777 • Fax (505) 344-4413

American Environmental Network (NM), Inc.

CHA. OF CUSTODY

DATE 5-19-98 PAGE: 1 OF 1

AEN (NM) Accession: 80653

SHADED AREAS ARE FOR LABORATORY USE ONLY

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER:

COMPANY: Giant Refining Company
ADDRESS: Route 3, Box 7
Gallup, NM 87301
PHONE: 505-722-3833
FAX: 505-722-0210
BILL TO: Giant Refining Co. /Ciniza
COMPANY: Same
ADDRESS:

SAMPLE ID	DATE	TIME	MATRIX	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline)	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐		8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310)	General Chemistry:	8270 Semi Vols	8260 BTEX	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals:	
OW-7-51898	5/18/98	0945	H_2O																					X	X							
OW-10-51898	5/18/98	1010	"																					X	X							

PROJECT INFORMATION

PROJ NO.:
PROJ NAME:
PO NO.:
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	10
CUSTODY SEALS	Y/N/NA
RECEIVED INTACT	Y/N/S
BLUE ICE/ICE	Y/N

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) [ ] 24hr [ ] 48hr [ ] 72hr [ ] 1 WEEK (NORMAL) [ ]

CERTIFICATION REQUIRED: [ ] NM [ ] SDWA [ ] OTHER

METHANOL PRESERVATION [ ]

COMMENTS: FIXED FEE [ ]

1998 Annual Groundwater sample

RELINQUISHED BY:	RELINQUISHED BY:
Signature: Time: 0900	Signature: Time:
Printed Name: Steve Morris Date: 5/19/98	Printed Name: Date:
Company: Giant	Company:
RECEIVED BY:	**RECEIVED BY (LAB):**
Signature: Time:	[illegible]
Printed Name: Date:	[illegible]
Company:	American Environmental Network (NM) Inc.

American Environmental Network, Inc.

CLIENT	: GIANT REFINING COMPANY	AEN I.D.	: 805378
PROJECT #	: (none)	DATE RECEIVED	: 5/20/98
PROJECT NAME	: (none)	REPORT DATE	:

AEN ID. #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-7-51898	AQUEOUS	5/18/98
02	OW-10-51898	AQUEOUS	5/18/98

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805378
PROJECT #	: (none)	DATE RECEIVED :	5/20/98
PROJECT NAME	: (none)		

SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
805378-02	OW-10-51898	AQUEOUS	5/18/98	N/A	05/21/98	1

PARAMETER	DET. LIMIT		UNITS
Benzene	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY		
1,2-Dichloroethane-d4	109	(80 - 120)
Toluene-d8	104	(88 - 110)
Bromofluorobenzene	103	(86 - 115)

CLIENT : AEN-New Mexico

MATRIX: Water

JOB No.: 82359

SEMIVOLATILE ORGANIC ANALYSIS RESULTS

Units: ug/l

Quantitation Factor (QF)	1.00	1.00	1.00			Method Practical Quantitation Limits (PQL)*
Method Blank I.D.	G4670	G4670	G4670			
Lab I.D.	SBLK15746	82359001	82359002			
Client I.D	METHOD BLANK	805378-01	805378-02			
		OW-7-51898	OW-10-51898			
Phenol	U	U	U			10.0
Bis(2-Chloroethyl)Ether	U	U	U			10.0
2-Chlorophenol	U	U	U			10.0
1,3-Dichlorobenzene	U	U	U			10.0
1,4-Dichlorobenzene	U	U	U			10.0
1,2-Dichlorobenzene	U	U	U			10.0
2-Methylphenol	U	U	U			10.0
2,2'-Oxybis(1-Chloropropane)	U	U	U			10.0
4-Methylphenol	U	U	U			10.0
N-Nitrosodi-n-Propylamine	U	U	U			10.0
Hexachloroethane	U	U	U			10.0
Nitrobenzene	U	U	U			10.0
Isophorone	U	U	U			10.0
2-Nitrophenol	U	U	U			10.0
2,4-Dimethylphenol	U	U	U			10.0
Bis(2-Chloroethoxy) Methane	U	U	U			10.0
2,4-Dichlorophenol	U	U	U			10.0
1,2,4-Trichlorobenzene	U	U	U			10.0
Naphthalene	U	U	U			10.0
4-Chloroaniline	U	U	U			10.0
Hexachlorobutadiene	U	U	U			10.0
4-Chloro-3-Methylphenol	U	U	U			10.0
2-Methylnaphthalene	U	U	U			10.0
Hexachlorocyclopentadiene	U	U	U			10.0
2,4,6-Trichlorophenol	U	U	U			10.0
2,4,5-Trichlorophenol	U	U	U			50.0
2-Chloronaphthalene	U	U	U			10.0
2-Nitroaniline	U	U	U			50.0
Dimethylphthalate	U	U	U			10.0
Acenaphthylene	U	U	U			10.0
2,6-Dinitrotoluene	U	U	U			10.0
3-Nitroaniline	U	U	U			50.0
Acenaphthene	U	U	U			10.0
2,4-Dinitrophenol	U	U	U			50.0
4-Nitrophenol	U	U	U			50.0

* Sample PQL (Practical Quantitation Limit) = Method PQL X QF

CLIENT : AEN-New Mexico

MATRIX: Water

JOB No.: 82359

SEMIVOLATILE ORGANIC ANALYSIS RESULTS

Units: ug/l

Quantitation Factor (QF)	1.00	1.00	1.00			Method Practical Quantitation Limits (PQL)*
Method Blank I.D.	G4670	G4670	G4670			
Lab I.D.	SBLK15746	82359001	82359002			
Client I.D	METHOD BLANK	805378-01	805378-02			
		OW-7-51898	OW-10-51898			
Dibenzofuran	U	U	U			10.0
2,4-Dinitrotoluene	U	U	U			10.0
Diethylphthalate	U	U	U			10.0
4-Chlorophenyl-Phenyl Ether	U	U	U			10.0
Fluorene	U	U	U			10.0
4-Nitroaniline	U	U	U			50.0
4,6-Dinitro-2-Methylphenol	U	U	U			50.0
N-Nitrosodiphenylamine (1)	U	U	U			10.0
4-Bromophenyl-Phenylether	U	U	U			10.0
Hexachlorobenzene	U	U	U			10.0
Pentachlorophenol	U	U	U			50.0
Phenanthrene	U	U	2J			10.0
Anthracene	U	U	U			10.0
Carbazole	U	U	U			10.0
Di-n-Butylphthalate	U	U	U			10.0
Fluoranthene	U	U	3J			10.0
Pyrene	U	U	2J			10.0
Butylbenzylphthalate	U	U	U			10.0
3,3'-Dichlorobenzidine	U	U	U			10.0
Benzo(a)Anthracene	U	U	1J			10.0
Chrysene	U	U	U			10.0
Bis(2-Ethylhexyl)Phthalate	U	U	U			10.0
Di-n-Octylphthalate	U	U	U			10.0
Benzo(b)Fluoranthene	U	U	1J			10.0
Benzo(k)Fluoranthene	U	U	U			10.0
Benzo(a)Pyrene	U	U	U			10.0
Indeno(1,2,3-cd)Pyrene	U	U	U			10.0
Dibenz(a,h)Anthracene	U	U	U			10.0
Benzo(g,h,i)Perylene	U	U	U			10.0

* Sample PQL (Practical Quantitation Limit) = Method PQL X QF

American Environmental Network, Inc.

GC/MS RESULTS

TEST	: VOLATILE ORGANICS EPA METHOD 8260		
CLIENT	: GIANT REFINING COMPANY	AEN I.D. :	805378
PROJECT #	: (none)		
PROJECT NAME	: (none)		

SAMPLE ID #	BATCH	MATRIX	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
REAGENT BLANK	052198	AQUEOUS	N/A	05/21/98	1

PARAMETER	DET. LIMIT		UNITS
1,1-Dichloroethene	1.0	< 1.0	ug/L
Benzene	1.0	< 1.0	ug/L
Trichloroethene	1.0	< 1.0	ug/L
Toluene	1.0	< 1.0	ug/L
Chlorobenzene	1.0	< 1.0	ug/L
Ethylbenzene	1.0	< 1.0	ug/L
m&p Xylenes	1.0	< 1.0	ug/L
o-Xylene	1.0	< 1.0	ug/L

SURROGATE % RECOVERY	
1,2-Dichloroethane-d4	105 (80 - 120)
Toluene-d8	99 (88 - 110)
Bromofluorobenzene	94 (86 - 115)

American Environmental Network, Inc.

Spike Recovery and RPD Summary Report - WATER

Method : C:\HPCHEM\1\METHODS\82600310.M (RTE Integrator)
Title : AEN New Mexico GC/MS
Last Update : Tue May 12 14:39:09 1998
Response via : Initial Calibration

Non-Spiked Sample: 05219811.D

	Spike Sample	Spike Duplicate Sample
File ID :	052198S1.D	052198S2.D
Sample :	805377-04 MS	805377-04 MS
Acq Time:	21 May 98 4:56 pm	21 May 98 5:32 pm

Compound	Sample Conc	Spike Added	Spike Res	Dup Res	Spike %Rec	Dup %Rec	RPD	QC Limits RPD	QC Limits % Rec
1,1-Dichloroethene	0.0	50	48	48	97	96	1	14	61-145
Benzene	0.0	50	50	50	101	101	0	11	76-127
Trichloroethene	0.0	50	50	50	101	99	1	14	71-120
Toluene	0.0	50	50	48	99	96	3	13	76-125
ılorobenzene	0.0	50	48	47	95	94	1	13	75-130

- Fails Limit Check

82600310.M Fri May 29 12:04:59 1998

American Environmental Network
628 Route 10 • Whippany, NJ 07981 • (973) 428-8181 • Fax (973) 428-5222

REPORT TRANSMITTAL

JUNE 10, 1998

AEN-NEW MEXICO

Project: GIANT REFINING COMPANY/805378

PREPARED BY:

AMERICAN ENVIRONMENTAL NETWORK INC.

(CERTIFICATION NUMBER 14530)

AEN JOB No. 20980-82359

VOLUME 1 of 1

JUNE 10, 1998

20980-82359
AEN-NEW MEXICO
2709-D PAN AMERICAN FREEWAY, N.E.
ALBUQUERQUE , NM 87107

ATTENTION: K.MCNEILL

The following samples were received for analysis by AEN-NJ (Cert.#14530). These samples were received on and labeled as follows:

AEN Sample No.:	Client ID:	Date Received
82359001	805378-01	05/21/98
82359002	805378-02	05/21/98

DATA RELEASE AUTHORIZED BY: Brian Wood

Brian W. Wood
Director of Operations

AEN-NJ Lab Certifications

AEN-NJ possesses the following regulatory certifications and is currently certified to perform analysis in accordance with regulations pertaining to these certifications. Certificates are on file at the laboratory.

State/Agency Certification	Lab ID Number
CLP Organics Contract	68D50011
Connecticut	PH0722
Maryland	195
New Jersey	14530
New York	10997
North Carolina	339
Pennsylvania	68-355
Rhode Island	178
West Virginia	258
USDA Permit	S-3295 Revised
Delaware	NJ323

Last updated: 3/24/98

CHAIN OF CUSTODY

AMER N ENVIRONMENTAL NETWORK
Albuque e, New Mexico

Interlab C ain of Custody

DATE: 5/20/98 PAGE. OF 1

NETWORK PROJECT MANAGER: KIMBERLY D. McNEILL

COMPANY: AMERICAN ENVIRONMENTAL NETWORK
ADDRESS: 2709-D Pan American Freeway, NE
Albuquerque, NM 87107

82359

CLIENT PROJECT MANAGER:

Kim McNeill

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Metals - TAL	Metals - PP List	Metals - RCRA	RCRA Metals by TCLP (1311)			TOX	TOC	Gen Chemistry			Oil and Grease	BOD	COD	Pesticides/PCB (608/8080)	Herbicides (615/8150)	Base/Neutral Acid Compounds GC/MS (625/8270)	Volatile Organics GC/MS (624/8240)	Polynuclear Aromatics (610/8310)	8240 (TCLP 1311) ZHE	8270 (TCLP 1311)			TO-14	Gross Alpha/Beta				NUMBER OF CONTAINERS
805378-01	5/18	0945	AQ	001																	X												
-02	↓	1010	↓	002																	X												

PROJECT INFORMATION	
PROJECT NUMBER:	805378
PROJECT NAME:	Giant Refining Co.
QC LEVEL:	(STD.) IV
(QC REQUIRED:)	MS MSD BLANK
TAT:	(STANDARD) RUSH!

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
INTACT?	
RECEIVED GOOD COND./COLD	
LAB NUMBER	

DUE DATE: 6/2
RUSH SURCHARGE:
CLIENT DISCOUNT:
SPECIAL CERTIFICATION REQUIRED: ☐YES ☐NO

SAMPLES SENT TO:	
CONNECTICUT	
ILLINOIS	
MASSACHUSETTS	
PENSACOLA	
PORTLAND	
PHOENIX	
N.CAROLINA	
New Jersey	X

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.
Signature: Francine Torivio Time: 1105	Signature: Time:
Printed Name: Francine Torivio Date: 5/20/98	Printed Name: Date:
Albuquerque	Company:
RECEIVED BY: 1.	RECEIVED BY: (LAB)
Signature: Time:	Signature: Time: 2000
Printed Name: Date:	Printed Name: Date: 5/21/98
Company:	Company:

METHODOLOGY REVIEW

ANALYSES	METHOD NUMBER
SEMIVOLATILES	SW846 3510A/8270B

ORGANICS ANALYSIS
DATA AND SAMPLE QUALIFIERS

DATA QUALIFIERS:

U - Indicates that the compound was analyzed for but not detected.

J - This qualifier indicates an estimated concentration. This qualifier is used (1) when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL or PQL but greater than zero, and (3) when the retention time data indicate the presence of a compound that meets the Pesticide/Aroclor identification criteria, and the result is less than the CRQL or PQL but greater than zero.

B - This qualifier is used when the analyte is found in a method blank as well as the sample. It indicates possible sample contamination and warns the user to use caution when applying the results of this analyte.

E - Exceeds calibration curve

A - Indicates that a tentatively identified compound is a suspected Aldol-condensation product.

N - Indicates presumptive evidence of a compound. This qualifier is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all tentatively identified compound results. For generic classification of a tentatively identified compound, such as chlorinated hydrocarbon, the N code is not used.

D - This qualifier identifies all compounds identified in an analysis at a secondary dilution factor.

P - Indicates that the quantitative results from the two GC columns differed by more than 25 percent.

SAMPLE QUALIFIERS:

DL - Indicates that the analysis was performed at a secondary dilution.

RE - Rerun - Indicates that the analysis is a reinjection or a reextraction and reanalysis, usually due to a failed QC element in the initial analysis.

LABORATORY CHRONICLE

AEN, Inc. - NEW JERSEY
SAMPLE RECEIPT VERIFICATION FORM

NUMBER : 82359 CLIENT NM DATE RECEIVED : 5/21/98

OF SAMPLES 2 # OF COOLERS 1
CUSTODY SEALS: PRESENT/ ABSENT INTACT/ BROKEN TEMPERATURE BLANK PRESENT: _YES ✓NO

COOLER TEMP/S ° C 5.0 ___ ___ ___ COOLER OUTSIDE 2- 6 ° C ___ PRESERVED: ICE/BLUE ICE/ NONE
IF OUTSIDE TEMP RANGE - WERE SAMPLES RECEIVED LESS THAN 4 HOURS FROM COLLECTION ? ___ YES ___ NO

CHAIN OF CUSTODY: PRESENT/ABSENT PROPERLY SIGNED, DATED, TIME : _YES _NO
SAMPLE TAGS : PRESENT/ ABSENT RECEIVED BY: DRIVER ___ IF SHIPPED AIRBILL PRESENT ___ #

COOLER RADIOACT. SCREEN BELOW *0.50 uR/hr* YES ___ NO ___ (INFORM SAFETY OFFICER IMMED.)
✓YES __ NO SAMPLE BOTTLES INTACT
✓YES __ NO PROPER CONTAINERS PER ANALYSIS USED
✓YES __ NO SAMPLE LABELS INTACT
✓YES __ NO LABELS COMPLETE AND LEGIBLE (ID, DATE,TIME,SIGNATURE,PRESERVATIVE)
✓YES __ NO SAMPLES RECEIVED WITHIN HOLDING TIME
✓YES __ NO SAMPLES PROPERLY PRESERVED
✓YES __ NO NO BUBBLES PRESENT VOA WATER MATRIX ✓NA
✓YES __ NO SUFFICIENT SAMPLE VOLUME RECEIVED

_____ INTIAL _____ DATE - RUSH REPORT ISSUED BY ✓NA
_____ INTIAL _____ DATE - pH ANALYSIS PERFORMED BY ✓NA
_____ INTIAL _____ DATE - % MOISTURE PERFORMED BY ✓NA
_____ INTIAL _____ DATE - SAMPLE COMPOSITE PERFORMED BY ✓NA

NOTE AND ITEMIZE BY SAMPLE AFFECTED, DISCREPANCIES AND NONCONFORMANCES FOUND: _____

PROJECT MANAGER INFORMED OF DISCREPANCIES : _____ INTIALS _____ DATE ✓NA

SUBCONTRACTING OF ANALYSIS REQUIRED __YES __ NO SUB COC COMPLETED __YES __ NO ✓NA
SUBCONTRACTED SAMPLES SHIPPED __YES __ NO CARRIER USED _____

FINAL INSPECTION

BOTTLES CORRECTLY LABELED ✓YES __ NO REVIEWED BY
INTERNAL CHAIN OF CUSTODY INITIATED ✓YES __ NO
ALL SIGNATURES AND DATES COMPLETE ✓YES __ NO

VERIFICATION FORM COMPLETE & ACCURATE: SUPERVISOR _____ DATE 5/21/98
Print name _____

CLIENT INFORMED OF DISCREPANCIES/NONCONFORMANCES BY PM _____ DATE ____ TIME ___

NAME CLIENT REPRESENTATIVE INFORMED _____ METHOD : PHONE ___ FAX ___

CORRECTIVE ACTION REQUESTED BY CLIENT: _____

CORRECTIVE ACTION TAKEN: _____

PROJECT MANAGER APPROVED VERIFICATION FORM COMPLETE : _____ DATE 5/26/98
Print name _____

TERNAL CHAIN OF CUSTODY CHRONIC
SAMPLE CONTROL

000000

JOB NUMBER : 82359 DATE RECEIVED : 5/26/98 DATE TO DISPOSE : 7/20/98

PLE CONTROL TECH. ANALYST SAMPLE #/ BOTTLE # / DEPART. / TEST

RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
[illegible]	5/21/98 15:30	[illegible]	5-21-98 1530	001 → 002 - 01 01 BNA
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED
[illegible]	5/21/98 16:00	[illegible]	5-21-98 1600	001, 002 - 01 01
RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED
RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED
RELINQUISHED BY	DATE TIME	RECEIVED BY	DATE TIME	SAMPLE #S / DEPARTMENT / ANALYSIS
RECEIVED BY	DATE TIME	RELINQUISHED BY	DATE TIME	SAMPLE STATUS DEPLETED/RETURNED

DP 6/8/98

Samples Disposed by _____ Date: _____ Soil Drum # _____ Water Drum # _____
Other : _____ Returned to client (Client Signature) _____ Date _____

AEN, INC. - NEW JERSEY

INTERNAL CHAIN OF CUSTODY CHRONICLE

BNA

JOB/CASE NUMBER: 82359

I confirm that I have performed the analysis below following SOP quidelines:

ANALYSIS:

Sample No(s)	Analyst Signature	Date
001,002	[illegible]	5/22/98

REANALYSIS:

Sample No(s)	Analyst Signature	Date

PREPARATION:

Sample No(s)	Extraction Tech. Signature	Date	Consumed
001, 002	R. [illegible]	5-21-98	

I confirm that I have reviewed all associated data for this job:

REVIEWED BY: Signature [illegible] Date 5/26/98

AUTHORIZATION: Data Release Authorized By: [illegible] Group Leader/Lab Manager — Date 6/11/98

AEN - NEW JERSEY SIGNATURE PAGE

Employee Name	Signature	Initials
REPORTS PRODUCTION		
Berchak, Tina	Tina Berchak	TB
Carman, Jennifer	Jennifer Carman	JC
Cignarella, Christine	Christine Cignarella	CC
Powers, Robert	Robert Powers	RP
Wood, Mary	Mary B. Wood	MBW
BOTTLE PREP		
Cajiao, Joaquin	Joaquin A. Cajiao	
D'Achille, Al	Al D'Achille	AD'A
Reynolds, Ed	Ed Reynolds	
Sander, James	James Sander	JS
SYSTEMS		
Canada, Josh	[illegible]	J. C.
PM		
Brack, Joe	[illegible]	
Coppola, Julianna	Julianna Coppola	J.C
Foschini, Mark	Mark Foschini	MF
Glenn, Dan	[illegible]	DG
Hobart, Paul	Paul Hobart	PH
ADMINISTRATION		
Gemma, Mike	Michael Gemma	MG
Nadzen, Al	Al Nadzen	
Petretti, Deana	Deana Petretti	DP
Williams, Kirsten	Kirsten Williams	KW

AEN - NEW JERSEY SIGNATURE PAGE

Employee Name	Signature	Initials
SAMPLE CONTROL		
Britton-Fedon, Wendy		WBF
Doeffinger, John		JMD
Droz, Efrain		ED
LAB DIRECTOR		
Wood, Brian	Brian Wood	BW
LAB MANAGER		
Gorman, Kevin	Kevin J Gorman	KJG
QA/QC MANAGER		
	Kevin J Gorman (GORMAN)	KJG
GC		
Carlone, John	John Carlone	JJC
Herrman, Claus		CH
Lena, John		
Manlangit, Ferdie		
Scott, Gordon		GDS
Tako, Lisa	Lisa Tako	LT
Waldron, Stacey	Stacey Waldron	SW
GC/MS VOA		
Acierno, Mark		MJA
Klusey, Sylvanus	Sylvanus Klusey	SK
Mauriello, Gregg		GM

AEN - NEW JERSEY SIGNATURE PAGE

Employee Name	Signature	Initials
GC/MS SEMIVOA		
Gustavo, Mato		
Hamernick, Richard		
O'Brien, Patrick		
Pappas, Jerry		
Stanton, Helen		
METALS		
Goudsward, Kevin		
Chang, Grace		
Cousineau, Paul		
Lane, Lisa		
Nadzen, Tim		
Patel, Darshana	Darshana Patel	DP.
WET CHEMISTRY		
Bussard, Karen		K.M.B.
Florance, Gerard		
Foti, Lisa		
Kenneweg, John		JK
Piatt, Ernest		
FIELD SERVICES		
Knudsen, Troy		
Morgan, Chris		
Murad, John		

REVISED 3/23/98

CONFORMANCE/NON-CONFORMANCE

Client: AEN - NEW MEXICO

Job No: 20980-82359

NONCONFORMANCE SUMMARY

SEMIVOLATILES

No problems were encountered.

SEMIVOLATILES

4B
SEMIVOLATILE METHOD BLANK SUMMARY

SBLK15746

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: G4670

Lab Sample ID: SBLK15746

Instrument ID: MSG

Date Extracted: 05/21/98

Matrix: (soil/water) Water

Date Analyzed: 05/22/98

Level: (low/med) low

Time Analyzed: 10:16

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	805378-01	82359001	G4678	18:17
02	805378-02	82359002	G4679	19:05
03	MW-4-3MSMS	82290005MS	G4687	15:30
04	MW-4-3MSDMSD	82290006MSD	G4688	16:18
05	SBLK15746BS	SBLK15746BS	G4689	17:06
06				
07				
08				
09				
10				
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30				

COMMENTS:

FORM IV SV

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: IEA-NJ

Job No. : 82359

	EPA SAMPLE NO.	S1 (NBZ) #	S2 (FBP) #	S3 (TPH) #	S4 (PHL) #	S5 (2FP) #	S6 (TBP) #	S7 (2CP) #	S8 (DCB) #	TOT OUT
01	SBLK15746	70	67	56	32	49	67			0
02	805378-01	91	104	66	38	59	74			0
03	805378-02	90	102	63	40	61	76			0
04	MW-4-3MSMS	74	89	61	32	49	105			0
05	MW-4-3MSDMSD	75	90	60	32	51	104			0
06	SBLK15746BS	72	86	59	30	47	97			0
07										
08										
09										
10										
11										
12										
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27										
28										
29										
30										

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl-d14	(33-141)
S4 (PHL)	= Phenol-d5	(10-94)
S5 (2FP)	= 2-Fluorophenol	(21-100)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of QC limits.
D System Monitoring Compound diluted out

FORM II SV-1

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: IEA-NJ

Job No. : 82359

Matrix Spike - Client Sample No.: MW-4-3MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	75	0	24	32	12-89
2-Chlorophenol	75	0	54	72	27-123
1,4-Dichlorobenzene	50	0	30	60	36-97
N-Nitroso-di-N-Prop.(1)	50	0	40	80	41-116
1,2,4-Trichlorobenzene	50	0	36	72	39-98
4-Chloro-3-Methylphenol	75	0	61	81	23-97
Acenaphthene	50	0	46	92	46-118
4-Nitrophenol	75	0	30	40	10-80
2,4-Dinitrotoluene	50	0	52	104*	24-96
Pentachlorophenol	75	0	78	104*	9-103
Pyrene	50	0	29	58	26-127

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	75	24	32	0	42	12-89
2-Chlorophenol	75	55	73	1	40	27-123
1,4-Dichlorobenzene	50	31	62	3	28	36-97
N-Nitroso-di-N-Prop.(1)	50	39	78	2	38	41-116
1,2,4-Trichlorobenzene	50	36	72	0	28	39-98
4-Chloro-3-Methylphenol	75	62	83	2	42	23-97
Acenaphthene	50	46	92	0	31	46-118
4-Nitrophenol	75	30	40	0	50	10-80
2,4-Dinitrotoluene	50	52	104*	0	38	24-96
Pentachlorophenol	75	78	104*	0	50	9-103
Pyrene	50	28	56	4	31	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.
RPD: 0 out of 11 outside limits
Spike Recovery: 4 out of 22 outside limits
COMMENTS:

3C
WATER SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: IEA-NJ

Job No. : 82359

Matrix Spike - Client Sample No.: SBLK15746BS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Phenol	75	0	22	29	12-89
2-Chlorophenol	75	0	52	69	27-123
1,4-Dichlorobenzene	50	0	26	52	36-97
N-Nitroso-di-N-Prop.(1)	50	0	36	72	41-116
1,2,4-Trichlorobenzene	50	0	31	62	39-98
4-Chloro-3-Methylphenol	75	0	58	77	23-97
Acenaphthene	50	0	44	88	46-118
4-Nitrophenol	75	0	26	35	10-80
2,4-Dinitrotoluene	50	0	48	96	24-96
Pentachlorophenol	75	0	64	85	9-103
Pyrene	50	0	27	54	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits.

Spike Recovery: 0 out of 11 outside limits

COMMENTS:

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: GG385

DFTPP Injection Date: 05/18/98

Instrument ID: MSG

DFTPP Injection Time: 09:45

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	53.3
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	59.7
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	45.7
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.6
275	10.0 - 30.0 of mass 198	19.7
365	Greater than 1.0% of mass 198	2.3
441	Present, but less than mass 443	9.1
442	Greater than 40.0% of mass 198	63.6
443	17.0 - 23.0% of mass 442	12.2 (19.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050	SSTD050	G4591	05/18/98	10:51
02	SSTD080	SSTD080	G4592	05/18/98	11:41
03	SSTD100	SSTD100	G4593	05/18/98	12:31
04	SSTD120	SSTD120	G4594	05/18/98	13:21
05	SSTD160	SSTD160	G4595	05/18/98	14:11
06	SSTD010	SSTD010	G4596	05/18/98	15:02
07					
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FORM V SV

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: GG392

DFTPP Injection Date: 05/22/98

Instrument ID: MSG

DFTPP Injection Time: 08:24

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	56.1
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	61.7
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	48.1
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.4
275	10.0 - 30.0 of mass 198	26.1
365	Greater than 1.0% of mass 198	3.0
441	Present, but less than mass 443	11.2
442	Greater than 40.0% of mass 198	77.7
443	17.0 - 23.0% of mass 442	15.6 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	G4668	05/22/98	08:41
02	SBLK15746	SBLK15746	G4670	05/22/98	10:16
03	805378-01	82359001	G4678	05/22/98	18:17
04	805378-02	82359002	G4679	05/22/98	19:05
05					
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08					
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FORM V SV

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: IEA-NJ

Job No. : 82359

Lab File ID: GG396 DFTPP Injection Date: 05/26/98

Instrument ID: MSG DFTPP Injection Time: 12:33

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	52.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	58.9
70	Less than 2.0% of mass 69	0.4 (0.6)1
127	40.0 - 60.0% of mass 198	48.6
197	Less than 1.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 - 9.0% of mass 198	7.0
275	10.0 - 30.0 of mass 198	21.1
365	Greater than 1.0% of mass 198	3.1
441	Present, but less than mass 443	10.1
442	Greater than 40.0% of mass 198	62.4
443	17.0 - 23.0% of mass 442	13.5 (21.7)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD080	SSTD080	G4686	05/26/98	12:49
02	MW-4-3MSMS	82290005MS	G4687	05/26/98	15:30
03	MW-4-3MSDMSD	82290006MSD	G4688	05/26/98	16:18
04	SBLK15746BS	SBLK15746BS	G4689	05/26/98	17:06
05					
06					
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22					

FORM V SV

Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4670.D
Acq On : 22 May 98 10:16 am
Sample : MSG;SBLK;
Misc : SBLK15746;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 10:57 1998

Vial: 4
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	9.59	152	253501	40.00 ppb	0.00
20) Naphthalene-d8	12.76	136	989837	40.00 ppb	-0.02
35) Acenaphthene-d10	17.33	164	683367	40.00 ppb	-0.03
56) Phenanthrene-d10	21.24	188	1389539	40.00 ppb	-0.02
68) Chrysene-d12	28.24	240	1802840	40.00 ppb	-0.04
77) Perylene-d12	32.49	264	1633587	40.00 ppb	-0.03
86) 1,4-Dichlorobenzene-d4B	9.59	152	253501	40.00 ppb	0.00
88) Perylene-d12B	32.49	264	1633587	40.00 ppb	-0.03
89) Acenaphthene-d10B	17.33	164	683367	40.00 ppb	-0.03
91) 1,4-Dichlorobenzene-d4C	9.95	152	122517	40.00 ppb	-0.02
94) Acenaphthene-d10C	17.33	164	683367	40.00 ppb	-0.03
96) Naphthalene-d8C	0.00	136	0	0.00 ppb	-14.23
98) Phenanthrene-d10C	21.24	188	1389539	40.00 ppb	-0.02

System Monitoring Compounds					%Recovery
4) 2-Fluorophenol	6.54	112	195991	36.58 ppb	48.77%
5) Phenol-d5	8.69	99	185376	24.14 ppb	32.19%
9) 2-Chlorophenol-d4	9.03	132	363806	53.37 ppb	71.15%
13) 1,2-Dichlorobenzene-d4	9.95	152	122517	26.60 ppb	53.20%
21) Nitrobenzene-d5	10.94	82	276283	35.17 ppb	70.34%
39) 2-Fluorobiphenyl	15.58	172	519094	33.64 ppb	67.28%
59) 2,4,6-Tribromophenol	19.40	332	234325	50.03 ppb	66.70%
71) Terphenyl-d14	25.45	244	1159543	28.23 ppb	56.46%

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

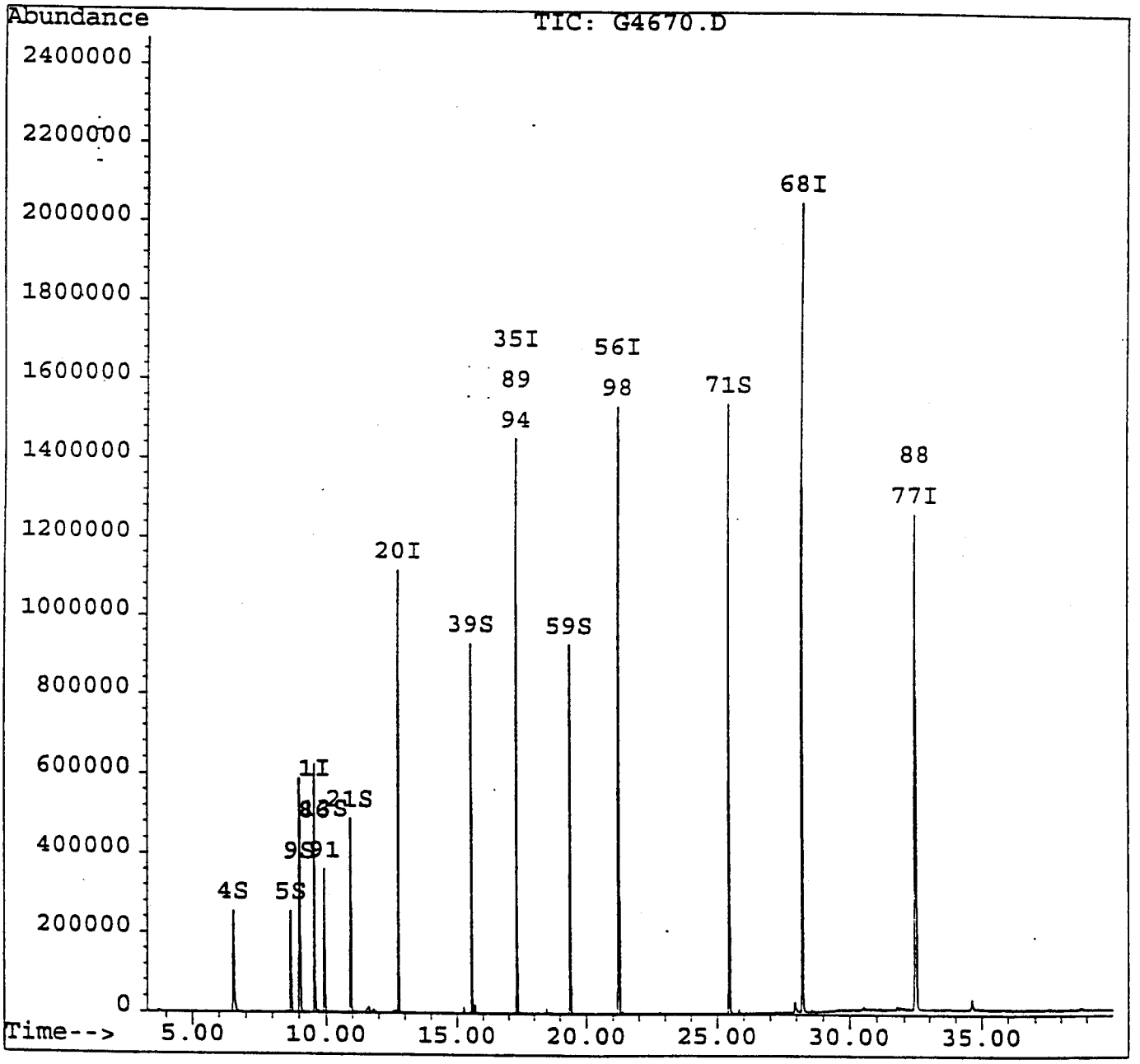
Quantitation Report

000027

Data File : C:\HPCHEM\1\DATA\052298\G4670.D
Acq On : 22 May 98 10:16 am
Sample : MSG;SBLK;
Misc : SBLK15746;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 10:57 1998

Vial: 4
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Multiple Level Calibration



Quantitation Report

000028

Data File : C:\HPCHEM\1\DATA\052298\G4678.D
Acq On : 22 May 98 18:17 pm
Sample : MSG;;
Misc : 82359001;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 18:58 1998

Vial: 12
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	9.57	152	264017	40.00 ppb	-0.02
20) Naphthalene-d8	12.76	136	1019255	40.00 ppb	-0.02
35) Acenaphthene-d10	17.33	164	676657	40.00 ppb	-0.03
56) Phenanthrene-d10	21.24	188	1372444	40.00 ppb	-0.02
68) Chrysene-d12	28.23	240	1658722	40.00 ppb	-0.06
77) Perylene-d12	32.46	264	1512846	40.00 ppb	-0.06
86) 1,4-Dichlorobenzene-d4B	9.57	152	264017	40.00 ppb	-0.02
88) Perylene-d12B	32.46	264	1512846	40.00 ppb	-0.06
89) Acenaphthene-d10B	17.33	164	676657	40.00 ppb	-0.03
91) 1,4-Dichlorobenzene-d4C	9.95	152	240093	40.00 ppb	-0.02
94) Acenaphthene-d10C	17.33	164	676657	40.00 ppb	-0.03
96) Naphthalene-d8C	0.00	136	0	0.00 ppb	-14.23
98) Phenanthrene-d10C	21.24	188	1372444	40.00 ppb	-0.02

System Monitoring Compounds					%Recovery
4) 2-Fluorophenol	6.54	112	246394	44.15 ppb	58.87%
5) Phenol-d5	8.67	99	227627	28.46 ppb	37.95%
9) 2-Chlorophenol-d4	9.02	132	457802	64.48 ppb	85.97%
13) 1,2-Dichlorobenzene-d4	9.95	152	240093	50.05 ppb	100.10%
21) Nitrobenzene-d5	10.94	82	368082	45.50 ppb	91.01%
39) 2-Fluorobiphenyl	15.58	172	794900	52.03 ppb	104.05%
59) 2,4,6-Tribromophenol	19.40	332	258080	55.79 ppb	74.38%
71) Terphenyl-d14	25.45	244	1244012	32.92 ppb	65.84%

Target Compounds Qvalue

RA
5-26-98

(#) = qualifier out of range (m) = manual integration

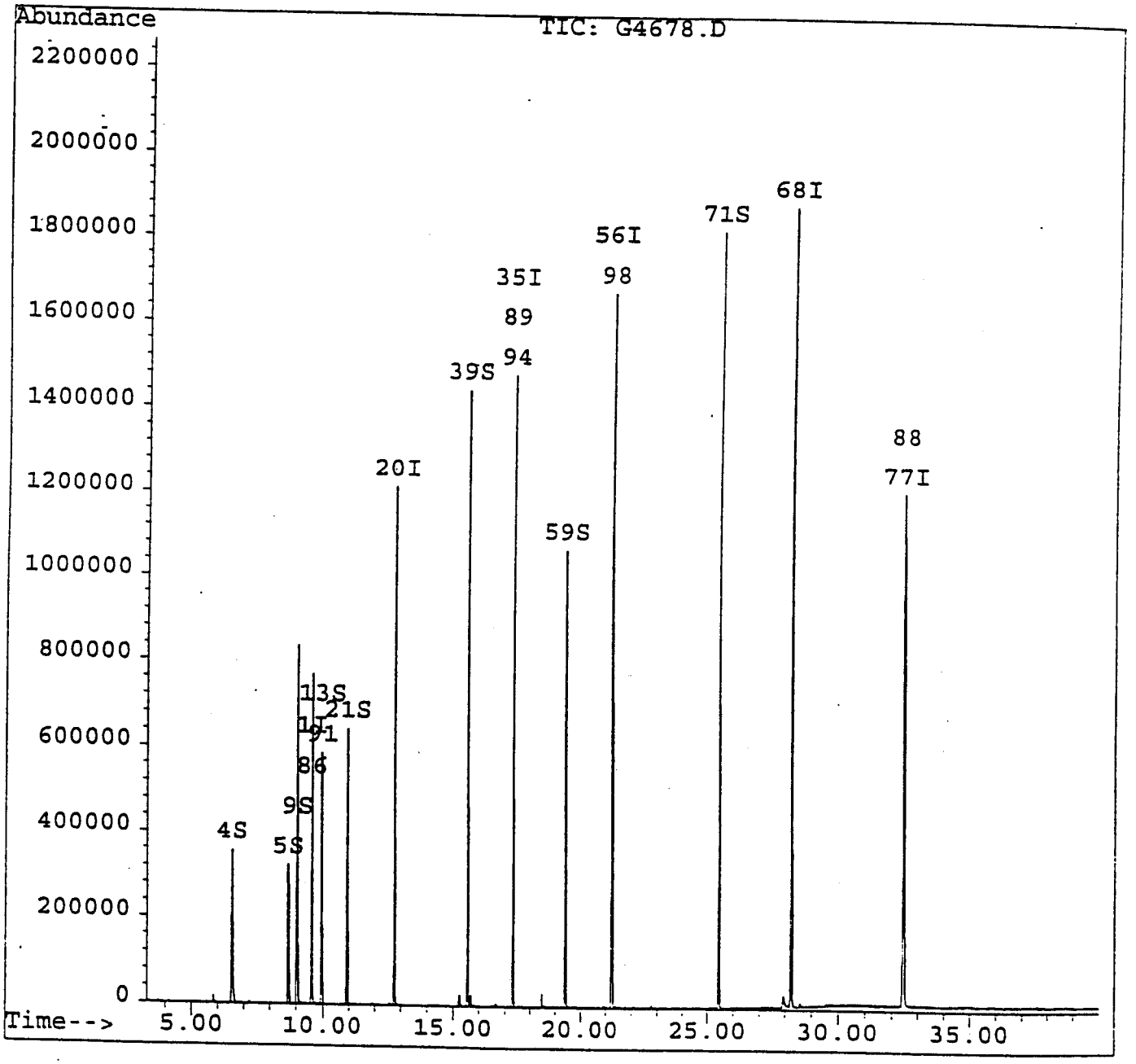
Quantitation Report

000029

Data File : C:\HPCHEM\1\DATA\052298\G4678.D
Acq On : 22 May 98 18:17 pm
Sample : MSG;;
Misc : 82359001;B;WG15746;AQ;;;;LOW;
Quant Time: May 22 18:58 1998

Vial: 12
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Multiple Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4679.D
Acq On : 22 May 98 19:05 pm
Sample : MSG;;
Misc : 82359002;B;WG15746;AQ;;;;LOW;
Quant Time: May 26 11:12 1998

Vial: 13
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) 1,4-Dichlorobenzene-d4	9.57	152	258689	40.00	ppb	-0.02
20) Naphthalene-d8	12.76	136	1010650	40.00	ppb	-0.02
35) Acenaphthene-d10	17.33	164	688585	40.00	ppb	-0.03
56) Phenanthrene-d10	21.24	188	1397536	40.00	ppb	-0.02
68) Chrysene-d12	28.23	240	1547848	40.00	ppb	-0.05
77) Perylene-d12	32.47	264	1880840	40.00	ppb	-0.06
86) 1,4-Dichlorobenzene-d4B	9.57	152	258689	40.00	ppb	-0.02
88) Perylene-d12B	32.47	264	1880840	40.00	ppb	-0.06
89) Acenaphthene-d10B	17.33	164	688585	40.00	ppb	-0.03
91) 1,4-Dichlorobenzene-d4C	9.95	152	235096	40.00	ppb	-0.02
94) Acenaphthene-d10C	17.33	164	688585	40.00	ppb	-0.03
96) Naphthalene-d8C	0.00	136	0	0.00	ppb	-14.23
98) Phenanthrene-d10C	21.24	188	1397536	40.00	ppb	-0.02

System Monitoring Compounds						%Recovery
4) 2-Fluorophenol	6.54	112	250910	45.89	ppb	61.19%
5) Phenol-d5	8.67	99	237974	30.37	ppb	40.49%
9) 2-Chlorophenol-d4	9.02	132	448891	64.53	ppb	86.03%
13) 1,2-Dichlorobenzene-d4	9.95	152	235096	50.02	ppb	100.03%
21) Nitrobenzene-d5	10.94	82	360196	44.91	ppb	89.82%
39) 2-Fluorobiphenyl	15.58	172	794796	51.12	ppb	102.24%
59) 2,4,6-Tribromophenol	19.40	332	268700	57.04	ppb	76.05%
71) Terphenyl-d14	25.46	244	1110619	31.49	ppb	62.99%

Target Compounds							Qvalue
64) Phenanthrene	21.29	178	52963	1.81	ppb		96
67) Fluoranthene	24.42	202	126145	3.42	ppb		82
70) Pyrene	25.03	202	100030	1.97	ppb		86
73) Benzo[a]anthracene	28.20	228	56912	1.16	ppb		86
79) Benzo[b]fluoranthene	31.17	252	54481	1.23	ppb	m	91

RA
5-26-98

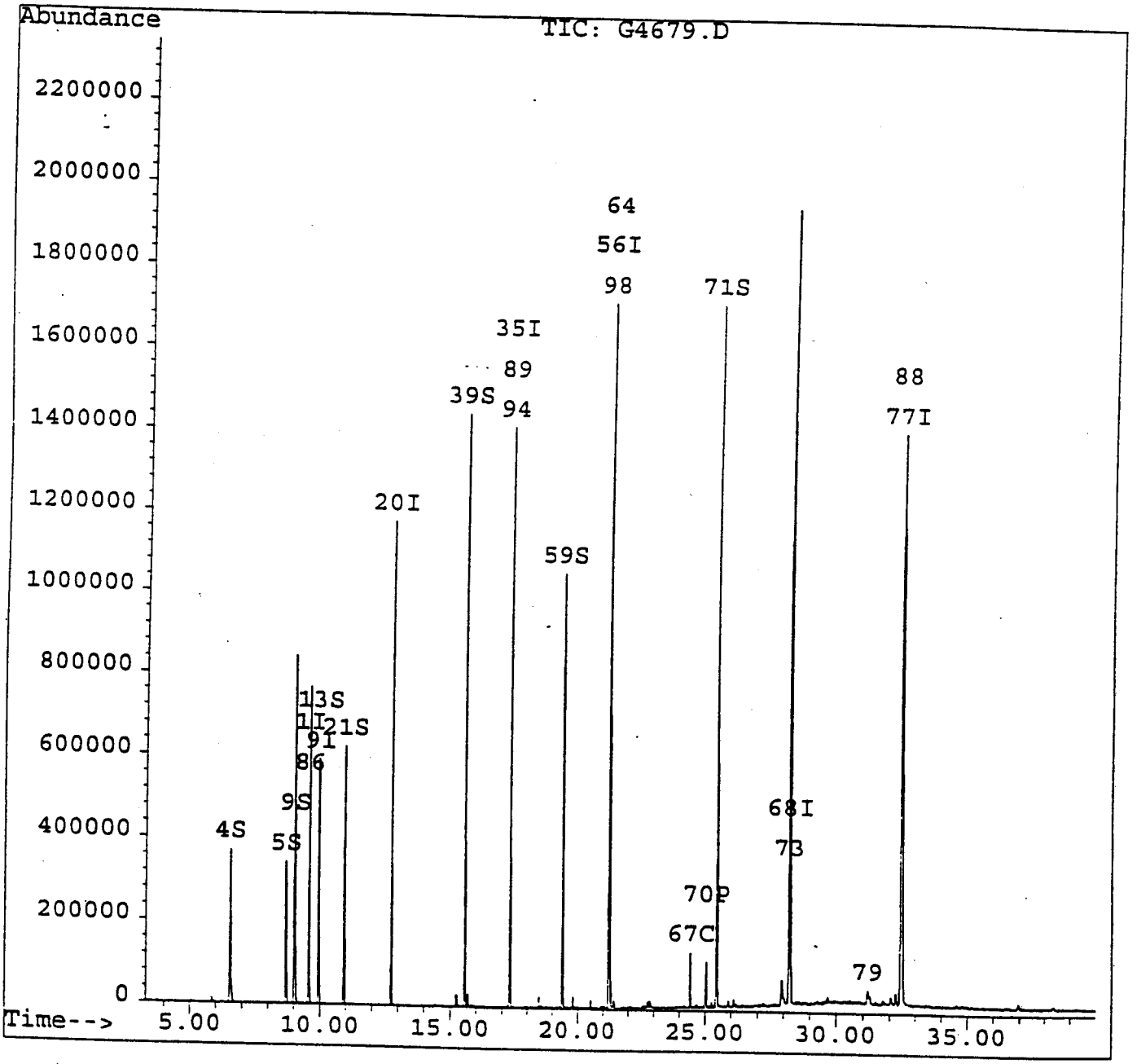
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\052298\G4679.D
Acq On : 22 May 98 19:05 pm
Sample : MSG;;
Misc : 82359002;B;WG15746;AQ;;;;LOW;
Quant Time: May 26 11:12 1998

Vial: 13
Operator: aen/nj
Inst : 5970-BNA1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\SW0518G.M
Title : BNA Calibration
Last Update : Fri May 22 09:23:52 1998
Response via : Multiple Level Calibration



CLIENT : AEN-New Mexico

MATRIX: Water

JOB No.: 82359

SEMIVOLATILE ORGANIC ANALYSIS RESULTS

Units: ug/l

Quantitation Factor (QF)	1.00	1.00	1.00			Method Practical Quantitation Limits (PQL)*
Method Blank I.D.	G4670	G4670	G4670			
Lab I.D.	SBLK15746	82359001	82359002			
Client I.D	METHOD BLANK	805378-01	805378-02			
		OW-7-51898	OW-10-51898			
Phenol	U	U	U			10.0
Bis(2-Chloroethyl)Ether	U	U	U			10.0
2-Chlorophenol	U	U	U			10.0
1,3-Dichlorobenzene	U	U	U			10.0
1,4-Dichlorobenzene	U	U	U			10.0
1,2-Dichlorobenzene	U	U	U			10.0
2-Methylphenol	U	U	U			10.0
2,2'-Oxybis(1-Chloropropane)	U	U	U			10.0
4-Methylphenol	U	U	U			10.0
N-Nitrosodi-n-Propylamine	U	U	U			10.0
Hexachloroethane	U	U	U			10.0
Nitrobenzene	U	U	U			10.0
Isophorone	U	U	U			10.0
2-Nitrophenol	U	U	U			10.0
2,4-Dimethylphenol	U	U	U			10.0
Bis(2-Chloroethoxy) Methane	U	U	U			10.0
2,4-Dichlorophenol	U	U	U			10.0
1,2,4-Trichlorobenzene	U	U	U			10.0
Naphthalene	U	U	U			10.0
4-Chloroaniline	U	U	U			10.0
Hexachlorobutadiene	U	U	U			10.0
4-Chloro-3-Methylphenol	U	U	U			10.0
2-Methylnaphthalene	U	U	U			10.0
Hexachlorocyclopentadiene	U	U	U			10.0
2,4,6-Trichlorophenol	U	U	U			10.0
2,4,5-Trichlorophenol	U	U	U			50.0
2-Chloronaphthalene	U	U	U			10.0
2-Nitroaniline	U	U	U			50.0
Dimethylphthalate	U	U	U			10.0
Acenaphthylene	U	U	U			10.0
2,6-Dinitrotoluene	U	U	U			10.0
3-Nitroaniline	U	U	U			50.0
Acenaphthene	U	U	U			10.0
2,4-Dinitrophenol	U	U	U			50.0
4-Nitrophenol	U	U	U			50.0

* Sample PQL (Practical Quantitation Limit) = Method PQL X QF

CLIENT : AEN-New Mexico

MATRIX: Water

JOB No.: 82359

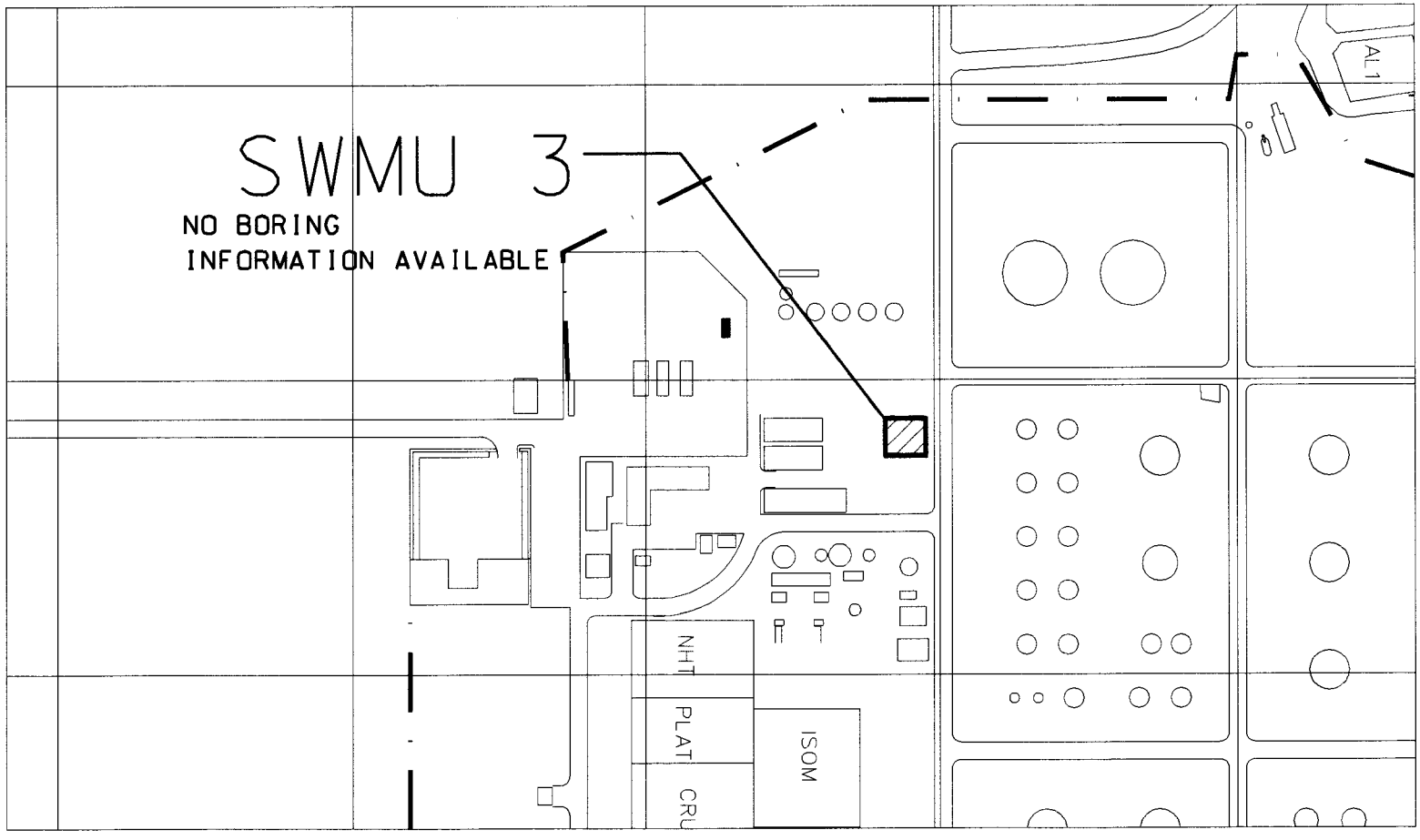
SEMIVOLATILE ORGANIC ANALYSIS RESULTS

Units: ug/l

Quantitation Factor (QF)	1.00	1.00	1.00			Method Practical Quantitation Limits (PQL)*
Method Blank I.D.	G4670	G4670	G4670			
Lab I.D.	SBLK15746	82359001	82359002			
Client I.D	METHOD BLANK	805378-01	805378-02			
		OW-7-51898	OW-10-51898			
Dibenzofuran	U	U	U			10.0
2,4-Dinitrotoluene	U	U	U			10.0
Diethylphthalate	U	U	U			10.0
4-Chlorophenyl-Phenyl Ether	U	U	U			10.0
Fluorene	U	U	U			10.0
4-Nitroaniline	U	U	U			50.0
4,6-Dinitro-2-Methylphenol	U	U	U			50.0
N-Nitrosodiphenylamine (1)	U	U	U			10.0
4-Bromophenyl-Phenylether	U	U	U			10.0
Hexachlorobenzene	U	U	U			10.0
Pentachlorophenol	U	U	U			50.0
Phenanthrene	U	U	2J			10.0
Anthracene	U	U	U			10.0
Carbazole	U	U	U			10.0
Di-n-Butylphthalate	U	U	U			10.0
Fluoranthene	U	U	3J			10.0
Pyrene	U	U	2J			10.0
Butylbenzylphthalate	U	U	U			10.0
3,3'-Dichlorobenzidine	U	U	U			10.0
Benzo(a)Anthracene	U	U	1J			10.0
Chrysene	U	U	U			10.0
Bis(2-Ethylhexyl)Phthalate	U	U	U			10.0
Di-n-Octylphthalate	U	U	U			10.0
Benzo(b)Fluoranthene	U	U	1J			10.0
Benzo(k)Fluoranthene	U	U	U			10.0
Benzo(a)Pyrene	U	U	U			10.0
Indeno(1,2,3-cd)Pyrene	U	U	U			10.0
Dibenz(a,h)Anthracene	U	U	U			10.0
Benzo(g,h,i)Perylene	U	U	U			10.0

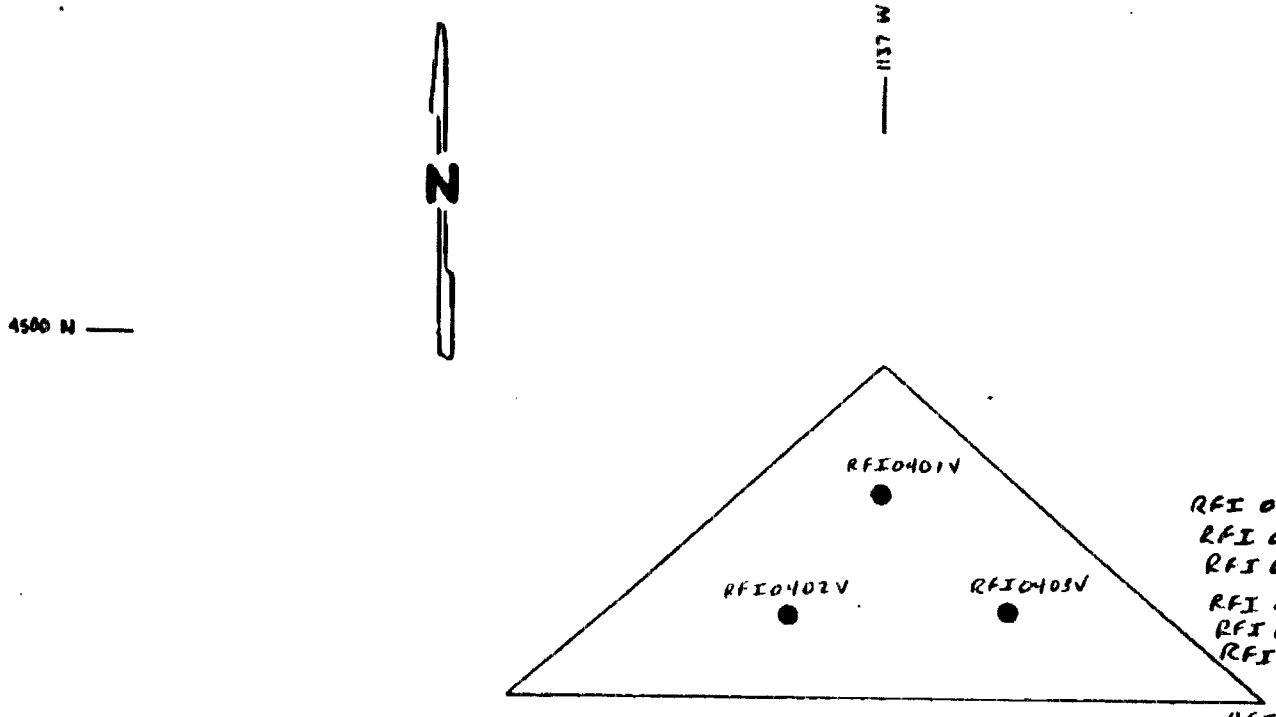
* Sample PQL (Practical Quantitation Limit)= Method PQL X QF

GIANT REFINING
CINIZA REFINERY
SWMU 3
EMPTY CONTAINER STORAGE AREA



12-5-89

12



RFI 0401 V 0.0
RFI 0401 V 3.0
RFI 0401 V 4.5
RFI 0402 V 0.0
RFI 0402 V 3.0
RFI 0402 V 4.5
RFI 0403 V 0.0
RFI 0403 V 3.0
RFI 0403 V 4.5

LEGEND

● Proposed Soil Boring Locations

0 5 10
SCALE IN FEET

GIANT REFINERY Gallup, New Mexico	Burn Pit	FIG.

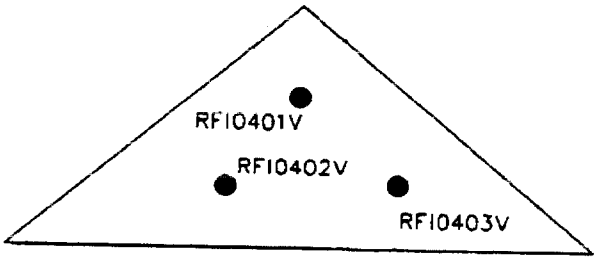
REVISION NO. 0

FILE NAME J4211\F01-002.DWG

DATE 10/27/92

DRAWN BY EMH

APPROVED BY



EXPLANATION

RF10401V SOIL BORING LOCATIONS

5 0 5 10 FEET

FIGURE 5
SWMU NO.4
OLD BURN PIT

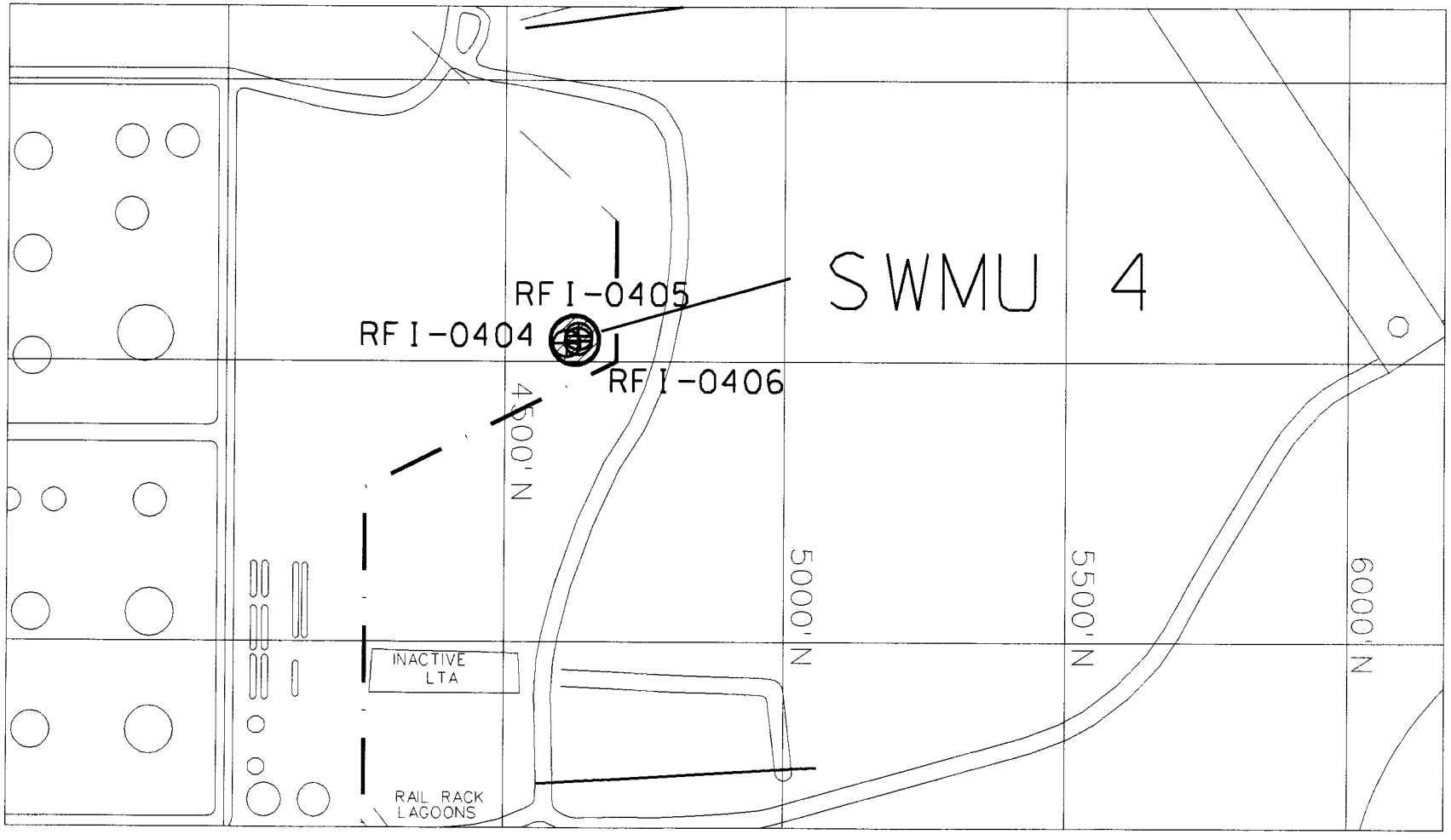
CINIZA REFINERY

PREPARED FOR

GIANT REFINING COMPANY
GALLUP, NEW MEXICO

Applied Environmental

GIANT REFINING
CINIZA REFINERY
SWMU 4
OLD BURN PIT



SHEET 1 OF 3

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0404

Water Level NOT ENCOUNT. Date: 07/29/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
	0.5		/*//*/		C	CLAY, SANDY, DAMP, VERY SOFT, BROWN				
	1.0		SSSSSS		C	FCC CATALYST(SILICA)				
			/*//*/		C	CLAY, SANDY, MOIST, SOFT, YELLOW STAINED/RED				
			/*//*/		C	BROWN				
			/*//*/	2.5	C					
	2.9		/*//*/		C					
			/*/*/*		C	CLAY, VERY SANDY, MOIST, VERY SOFT, RED BROWN				
			/*/*/*		C					
			/*/*/*		C					
	5.0		/*/*/*	5	C					
			//////		C	CLAY, WET TO MOIST, FIRM, RED BROWN				
			//////		C					
			//////		C					
			//////		C					
			//////	7.5	C					
			//////		C					
			//////		C					
	8.8		//////		C					
			0*		C	SAND, SLIGHTLY GRAVELLY, DAMP, MODERATELY				
	10.0		**0***	10	C	DENSE, BROWN				
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

Bore #1

SHEET 2 OF 3

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0405

Water Level NOT ENCOUNT. Date: 07/29/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			SSSSSS		C	**FCC CATALYST**(SILICA)				
			SSSSSS		C					
	1.4		SSSSSS		C					
			/-*/-*		C	**CLAY**, SILTY, SANDY, WET, SOFT, YELLOW GRADING				
			/-*/-*	2.5	C	TO BLACK AT 3'				
	3.3		/-*/-*		C					
	3.8		AAAAAA		C	**ASPHALT BURN RESIDUE**				
	4.0		/*//*/		C	**CLAY**, SANDY, MOIST, SOFT, YELLOW BROWN				
			*0**0*		C	**SAND**, SCATTERED HIGHLY WEATHERED GRAVEL, MOIST				
			*0**0*	5	C	MODERATELY DENSE, YELLOW BROWN, FREE SURFACE				
	5.4		*0**0*		C	FLUID				
			//////		C	**CLAY**, WET, FIRM TO STIFF, RED BROWN				
			//////		C					
			//////		C					
			//////	7.5	C					
			//////		C					
			//////		C					
	8.8		//////		C					
			*-**-*		C	**SAND**, SILTY, MOIST, MODERATELY DENSE, LIGHT				
	10.0		*-**-*	10	C	BROWN				
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

SHEET 3 OF 3

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0406

Water Level NOT ENCOUNT. Date: 07/29/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-*/-*		C	**CLAY**, SANDY, SILTY, MOIST, FIRM, BROWN, SOME				
			/-*/-*		C	FCC CATALYST SILICA LENSES				
			/-*/-*		C					
			/-*/-*		C					
	2.6		/-*/-*	2.5	C					
			SSSSSS		C	**FCC CATALYST**(SILICA)				
	3.4		SSSSSS		C					
			/*-/*-		C	**CLAY**, SANDY, SILTY, MOIST, FIRM, YELLOW				
	4.6		/*-/*-		C	STAINING BROWN MATRIX				
			AAAAAA	5	C	**ASPHALTIC BURN RISIDUE**				
	5.4		AAAAAA		C					
	5.8				C	**SANDSTONE**, FRIABLE, MOIST, HARD, BROWN RED				
			//////		C	**CLAY**, WET, STIFF, BROWN TO RED				
			//////		C					
			//////	7.5	C					
			//////		C					
	8.6		//////		C					
			/*/*/*		C	**CLAY/SAND**, INTERBEDS(1" THICK), MOIST, STIFF/				
			/*/*/*		C	MODEERATELY DENSE, BROWN				
	10.0		/*/*/*	10	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

GIANT REFINING COMPANY CINIZA

SWMU #4 TOTAL METALS

PARAMETER	DETECTION LIMIT	CORING NUMBER 04V6.0	04V10.0	04V10.0D	05V6.0
Cadmium	2.5	<2.5	<2.5	<2.5	<2.5
Chromium	2.5	11	7.7	7.3	12
Lead	5.0	15	11	12	15
Mercury	0.25	<0.25	<0.25	<0.25	<0.25
Arsenic	2.5	<2.5	<2.5	<2.5	<2.5
Barium	5.0	130	240	260	170
Beryllium	2.5	<2.5	<2.5	<2.5	<2.5
Nickel	2.5	16	10	11	18
Vanadium	2.5	5.4	3.7	4.7	6.5

		05V10.0	06V6.0	06V10.0
Cadmium	2.5	<2.5	<2.5	<2.5
Chromium	2.5	5.2	10	9.9
Lead	5.0	12	15	13
Mercury	0.25	<0.25	<0.25	<0.25
Arsenic	2.5	<2.5	<2.5	<2.5
Barium	5.0	230	150	220
Beryllium	2.5	<2.5	<2.5	<2.5
Nickel	2.5	9.2	18	9.5
Vanadium	2.5	4.0	6.4	4.6

TLS 9/94

GIANT REFINING COMPANY CINIZA

SWMU #4 **8240/8260 SKINNER LIST**

PARAMETER	DETECTION LIMIT	CORING NUMBER 04V6.0	04V10.0	04V10.0D	05V6.0
Benzene	0.5	<0.5	<0.5	<0.5	<0.5
Carbon Disulfide	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
Chloroethylvinyl Ether	1.0	<1.0	<1.0	<1.0	<1.0
1,2–Dibromoethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2–Dichloroethane	5.0	<5.0	<5.0	<5.0	<5.0
1,4–Dioxane	50.0	<50.0	<50.0	<50.0	<50.0
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5
Methyl Ethyl Ketone	1.0	<1.0	<1.0	<1.0	<1.0
Styrene	0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	0.5	<0.5	<0.5	<0.5	<0.5

		05V10.0	06V6.0	06V10.0
Benzene	0.5	<0.5	<0.5	<0.5
Carbon Disulfide	0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5
Chloroethylvinyl Ether	1.0	<1.0	<1.0	<1.0
1,2–Dibromoethane	0.5	<0.5	<0.5	<0.5
1,2–Dichloroethane	5.0	<5.0	<5.0	<5.0
1,4–Dioxane	50.0	<50.0	<50.0	<50.0
Ethylbenzene	0.5	<0.5	<0.5	<0.5
Methyl Ethyl Ketone	1.0	<1.0	1.2	<1.0
Styrene	0.5	<0.5	<0.5	<0.5
Toluene	0.5	<0.5	<0.5	<0.5
Xylenes	0.5	<0.5	<0.5	<0.5

TLS 9/94

GIANT REFINING COMPANY CINIZA

SWMU #4 8270 SKINNER LIST

PARAMETER	DETECTION LIMIT	CORING NUMBER 04V6.0	04V10.0	04V10.0D	05V6.0
Anthracene	5.0	<5.0	<5.0	<5.0	<5.0
Benzenethiol	5.0	<5.0	<5.0	<5.0	<5.0
Benzo(a)anthracene	5.0	<5.0	<5.0	<5.0	<5.0
Benzo(b)flouranthene	5.0	<5.0	<5.0	<5.0	<5.0
Benzo(k)flouranthene	5.0	<5.0	<5.0	<5.0	<5.0
Benzo(a)pyrene	5.0	<5.0	<5.0	<5.0	<5.0
Bis(2-ethylhexyl) phthalate	5.0	<5.0	<5.0	<5.0	<5.0
Butyl Benzyl phthalate	5.0	<5.0	<5.0	<5.0	<5.0
Chrysene	5.0	<5.0	<5.0	<5.0	<5.0
Dibenz(a,j)acridine	5.0	<5.0	<5.0	<5.0	<5.0
Dibenzo(a,h)anthracene	5.0	<5.0	<5.0	<5.0	<5.0
Di-n-btyl phthalate	5.0	<5.0	<5.0	<5.0	<5.0
2-Dichlorobenzene	5.0	<5.0	<5.0	<5.0	<5.0
,3-Dichlorobenzene	5.0	<5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene	5.0	<5.0	<5.0	<5.0	<5.0
Diethyl phthalate	5.0	<5.0	<5.0	<5.0	<5.0
7,12-Dimethylbenz(a) anthracene	5.0	<5.0	<5.0	<5.0	<5.0
2,4-Dimethylphenol	5.0	<5.0	<5.0	<5.0	<5.0
Dimethyl phthalate	5.0	<5.0	<5.0	<5.0	<5.0
2,4-Dinitrophenol	25.0	<25.0	<25.0	<25.0	<25.0
Di-n-octyl phthalate	5.0	<5.0	<5.0	<5.0	<5.0
Flouranthene	5.0	<5.0	<5.0	<5.0	<5.0
Indene	5.0	<5.0	<5.0	<5.0	<5.0
Methylchrysene	5.0	<5.0	<5.0	<5.0	<5.0
1-Methylnaphthalene	5.0	<5.0	<5.0	<5.0	<5.0
2,4-Dimethylphenol	5.0	<5.0	<5.0	<5.0	<5.0
3-Methylphenol	5.0	<5.0	<5.0	<5.0	<5.0
4-Methylphenol	5.0	<5.0	<5.0	<5.0	<5.0
Naphthalene	5.0	<5.0	<5.0	<5.0	<5.0
4-Nitrophenol	25.0	<25.0	<25.0	<25.0	<25.0
Phenanthrene	5.0	<5.0	<5.0	<5.0	<5.0
Phenol	5.0	<5.0	<5.0	<5.0	<5.0
Pyrene	5.0	<5.0	<5.0	<5.0	<5.0
Pyroline	10.0	<10.0	<10.0	<10.0	<10.0
Quinoline	25.0	<25.0	<25.0	<25.0	<25.0

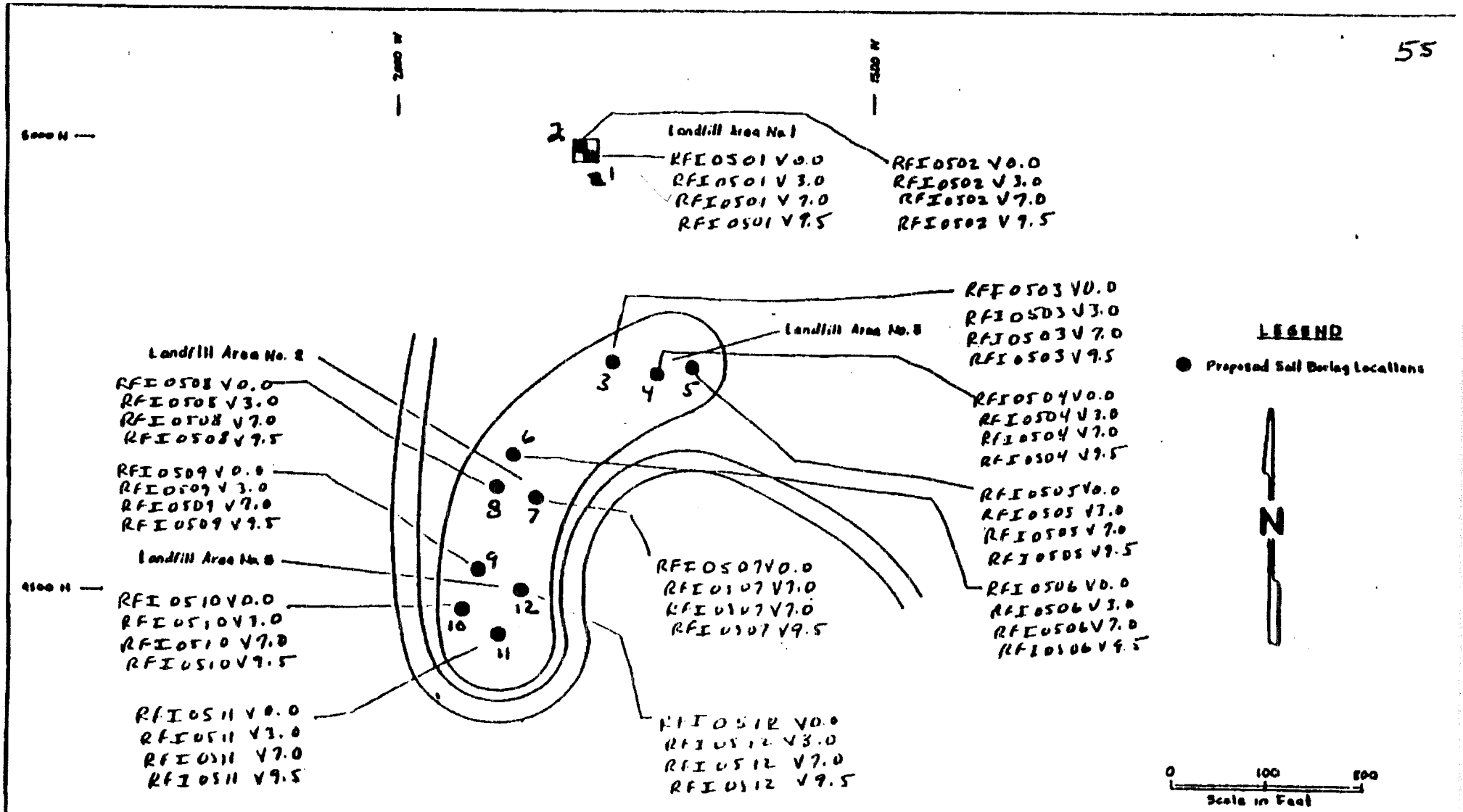
TLS 9/94

GIANT REFINING COMPANY CINIZA

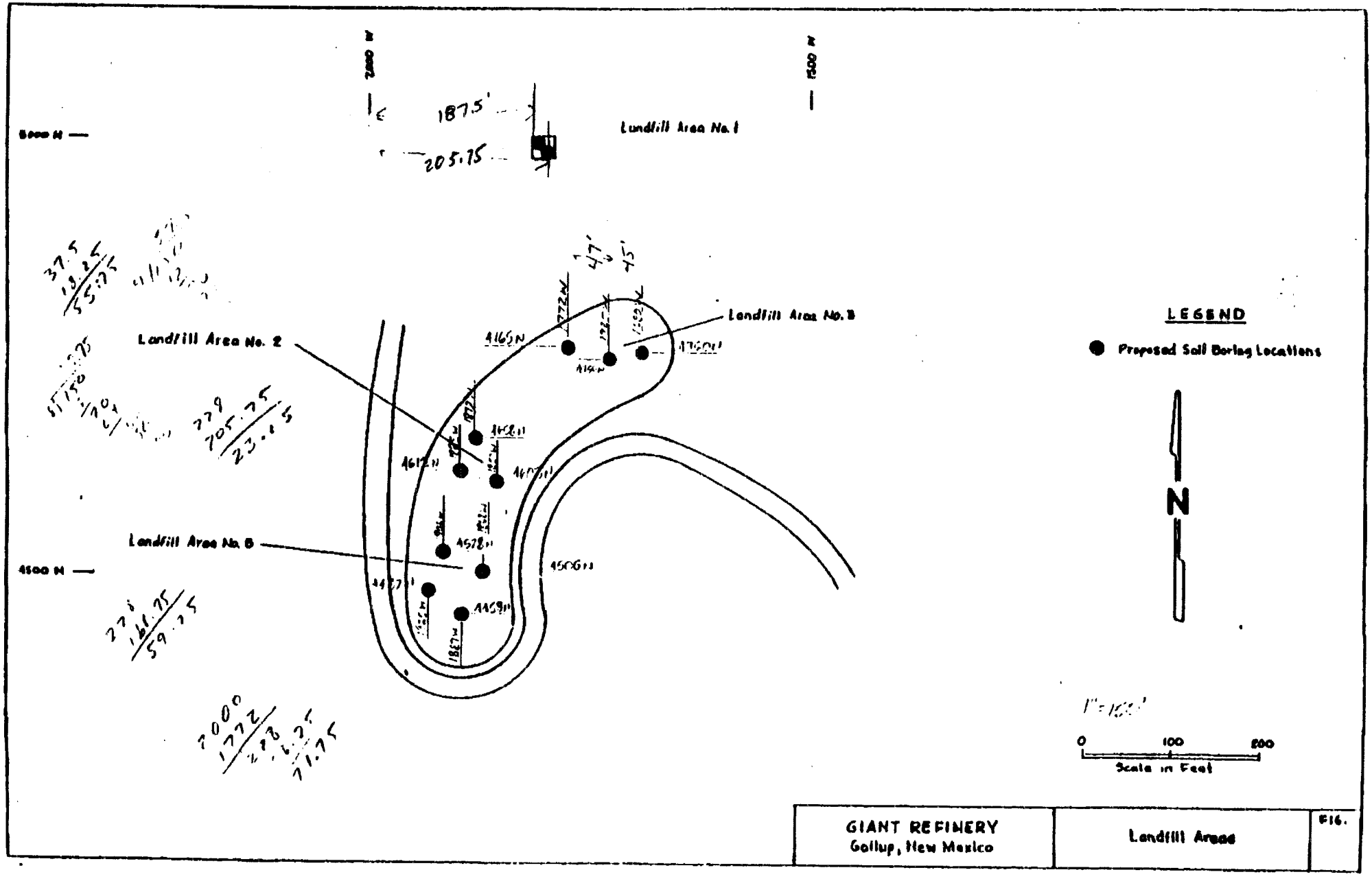
SWMU #4 8270 SKINNER LIST, cont.

PARAMETER	DETECTION LIMIT	05V10.0	06V6.0	06V10.0
Anthracene	5.0	<5.0	<5.0	<5.0
Benzenethiol	5.0	<5.0	<5.0	<5.0
Benzo(a)anthracene	5.0	<5.0	<5.0	<5.0
Benzo(b)flouranthene	5.0	<5.0	<5.0	<5.0
Benzo(k)flouranthene	5.0	<5.0	<5.0	<5.0
Benzo(a)pyrene	5.0	<5.0	<5.0	<5.0
Bis(2-ethylhexyl) phthalate	5.0	<5.0	<5.0	<5.0
Butyl Benzyl phthalate	5.0	<5.0	<5.0	<5.0
Chrysene	5.0	<5.0	<5.0	<5.0
Dibenz(a,j)acridine	5.0	<5.0	<5.0	<5.0
Dibenzo(a,h)anthracene	5.0	<5.0	<5.0	<5.0
Di-n-btyl phthalate	5.0	<5.0	<5.0	<5.0
1,2-Dichlorobenzene	5.0	<5.0	<5.0	<5.0
1,3-Dichlorobenzene	5.0	<5.0	<5.0	<5.0
1,4-Dichlorobenzene	5.0	<5.0	<5.0	<5.0
Diethyl phthalate	5.0	<5.0	<5.0	<5.0
7,12-Dimethylbenz(a) anthracene	5.0	<5.0	<5.0	<5.0
2,4-Dimethylphenol	5.0	<5.0	<5.0	<5.0
Dimethyl phthalate	5.0	<5.0	<5.0	<5.0
2,4-Dinitrophenol	25.0	<25.0	<25.0	<25.0
Di-n-octyl phthalate	5.0	<5.0	<5.0	<5.0
Flouranthene	5.0	<5.0	<5.0	<5.0
Indene	5.0	<5.0	<5.0	<5.0
Methylchrysene	5.0	<5.0	<5.0	<5.0
1-Methylnaphthalene	5.0	<5.0	<5.0	<5.0
2,4-Dimethylphenol	5.0	<5.0	<5.0	<5.0
3-Methylphenol	5.0	<5.0	<5.0	<5.0
4-Methylphenol	5.0	<5.0	<5.0	<5.0
Naphthalene	5.0	<5.0	<5.0	<5.0
4-Nitrophenol	25.0	<25.0	<25.0	<25.0
Phenanthrene	5.0	<5.0	<5.0	<5.0
Phenol	5.0	<5.0	<5.0	<5.0
Pyrene	5.0	<5.0	<5.0	<5.0
Pyroline	10.0	<10.0	<10.0	<10.0
Quinoline	25.0	<25.0	<25.0	<25.0

TLS 9/94



GIANT REFINERY Gallup, New Mexico	Landfill Areas	FIG



GIANT REFINERY Gallup, New Mexico	Landfill Areas	FIG.

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-15-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0501V0.0 Sample Time/Description: 8:30 Am DRY SOIL PID - Ø

Sample No. 0501V3.0 Sample Time/Description: 8:40 Am DAMP SOIL PID - Ø

Sample No. 0501V7.0 Sample Time/Description: 8:50 Am MOIST SOIL PID - Ø

Sample No. 0501V9.5 Sample Time/Description: 9:00 Am MOIST SOIL PID - Ø

Sample No. 0501D9.5 Sample Time/Description: 9:00 Am MOIST SOIL PID - Ø

Surface Terrain: FLAT HEAVY SURFACE VEGETATION. AROUND PERIMETER IS BRUSH 3-4' HIGH

Weather Conditions: CLEAR, 65°F, E WIND @ 2-5 mph

General Field Observations:

Boring Lithology: 0-1' RED CLAY, 1'-3' MULTICOLORED SOIL W/SOME METAL DEBRIS. RUSTY, 3'-7' RED CLAY, VERY MOIST @ 7'-7.5' WITH MOSTLY GRAVEL LAYER. 7.5'-9.0' RED CLAY W/SOME GRAY STREAKING.

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0502V0.0 Sample Time/Description: 9:00 AM DRY SOIL PID-Ø

Sample No. 0502V3.0 Sample Time/Description: 9:20 AM DAMP SOIL PID-Ø

Sample No. 0502V7.0 Sample Time/Description: 9:30 AM MOIST SOIL PID-Ø

Sample No. 0502V9.5 Sample Time/Description: 9:40 AM MOIST SOIL PID-Ø

Sample No. 0502E9.5 Sample Time/Description: 9:45 AM WATER

Surface Terrain: FLAT, DENSE SURFACE VEGETATION. BRUSH AROUND PERIMETER TO 4'.

Weather Conditions: CLEAR, 65°F, ESE WIND @ 2-3 mph.

General Field Observations:

Boring Lithology: 0-1.5' RED CLAY. 1.5-3.5' MULTICOLORED SOIL W/SOME DEBRIS. 3.5-7' RED/GRAY CLAY. 7-8' GRAVEL W/SOME WATER. 8'-9.5' RED/GRAY CLAY. DISTINCT GRAY BAND AT 9.0'. 3" THICK.

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. REF0503V00 Sample Time/Description: 11:15AM DRY SOIL PID-Ø

Sample No. 0503V3.0 Sample Time/Description: 11:25AM DRY SOIL PID-Ø

Sample No. 0503V7.0 Sample Time/Description: 11:35AM DRY SOIL PID-Ø

Sample No. 0503V9.5 Sample Time/Description: 10:45AM DRY SOIL PID-Ø

Sample No. 0503D9.5 Sample Time/Description: 11:45AM DRY SOIL PID-Ø

Surface Terrain: FLAT, SURFACE GROWTH TO 1½'.

Weather Conditions: CLEAR, 75°F, W WIND @ 5-10 mph

General Field Observations:

Boring Lithology: 0-3' DEBRIS/SOIL. 3' TO 5' MIXED RED/WHITE CLAY W/SOME DEBRIS AND ROCK. 5'-9.5' RED CLAY

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-13-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFFOSCH V0.0 Sample Time/Description: 1:00 DRY SOIL PID - Ø

Sample No. 0504V3.0 Sample Time/Description: 1:10 DRY SOIL PID - .01

Sample No. 0504V7.0 Sample Time/Description: 1:20 DRY SOIL PID - Ø

Sample No. 0504V9.5 Sample Time/Description: 1:30 DRY SOIL PID - .4

Sample No. 0504E9.5 Sample Time/Description: WATER

Surface Terrain: FLAT, SURFACE GROWTH TO 1½'

Weather Conditions: CLEAR, 75°F, W WIND @ 5-10 mph

General Field Observations: SIDES OF HOLE ARE SLOUGHING BADLY BETWEE 1 & 7'. STRONG CHANCE OF SOME CROSS CONTAMINATION.

Boring Lithology: 0-1' - CLAY/SAND MIX. 1' - 7' DEBRIS & DISCOLORED SOIL (RUSTY & BROWN). 7'-8' MIXED SOIL & CONCRETE. 8'-9.5' RED CLAY

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M GARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFI0505V0.0 Sample Time/Description: 1:40 DRY SOIL PID - Ø

Sample No. RFI0505V3.0 Sample Time/Description: 1:50 SOIL PID - Ø

Sample No. RFI0505V7.0 Sample Time/Description: 2:00 SOIL PID - Ø

Sample No. RFI0505V9.5 Sample Time/Description: 2:10 SOIL PID - Ø

Sample No. ~~[illegible]~~ Sample Time/Description:

Surface Terrain: SHALLOW SLOPE, SURFACE VEGETATION TO 1 1/2'

Weather Conditions: CLEAR, 75°F, W WIND @ 5-10 mpH

General Field Observations:

Boring Lithology: 0-1' MIXED CLAY/SAND: 1-1.5' BAND OF SOIL + DEBRIS. 1.5-6' . RED CLAY w/SOME SAND. 6'-7' SLIGHTLY RUSTY BAND. 7-9.5' DENSE RED CLAY

DATA MANAGEMENT

Sample Location: SWMU #5 Sample Date: 5-14-92

Sample Type: SOIL

Team Leader: L SHELTON

Sample Personnel: M BARNEY, T ROGERS

Sampling Method: AUGER

Sample No. RFF0510V0.0 Sample Time/Description: 10:10 Am DRY SOIL PID-0

Sample No. 0510V3.0 Sample Time/Description: 10:20 Am DAMP SOIL PID 0

Sample No. 0510V7.0 Sample Time/Description: 10:30 Am DAMP SOIL PID 0

Sample No. 0510V9.5 Sample Time/Description: 10:40 DAMP SOIL PID

Sample No. _____ Sample Time/Description: _____

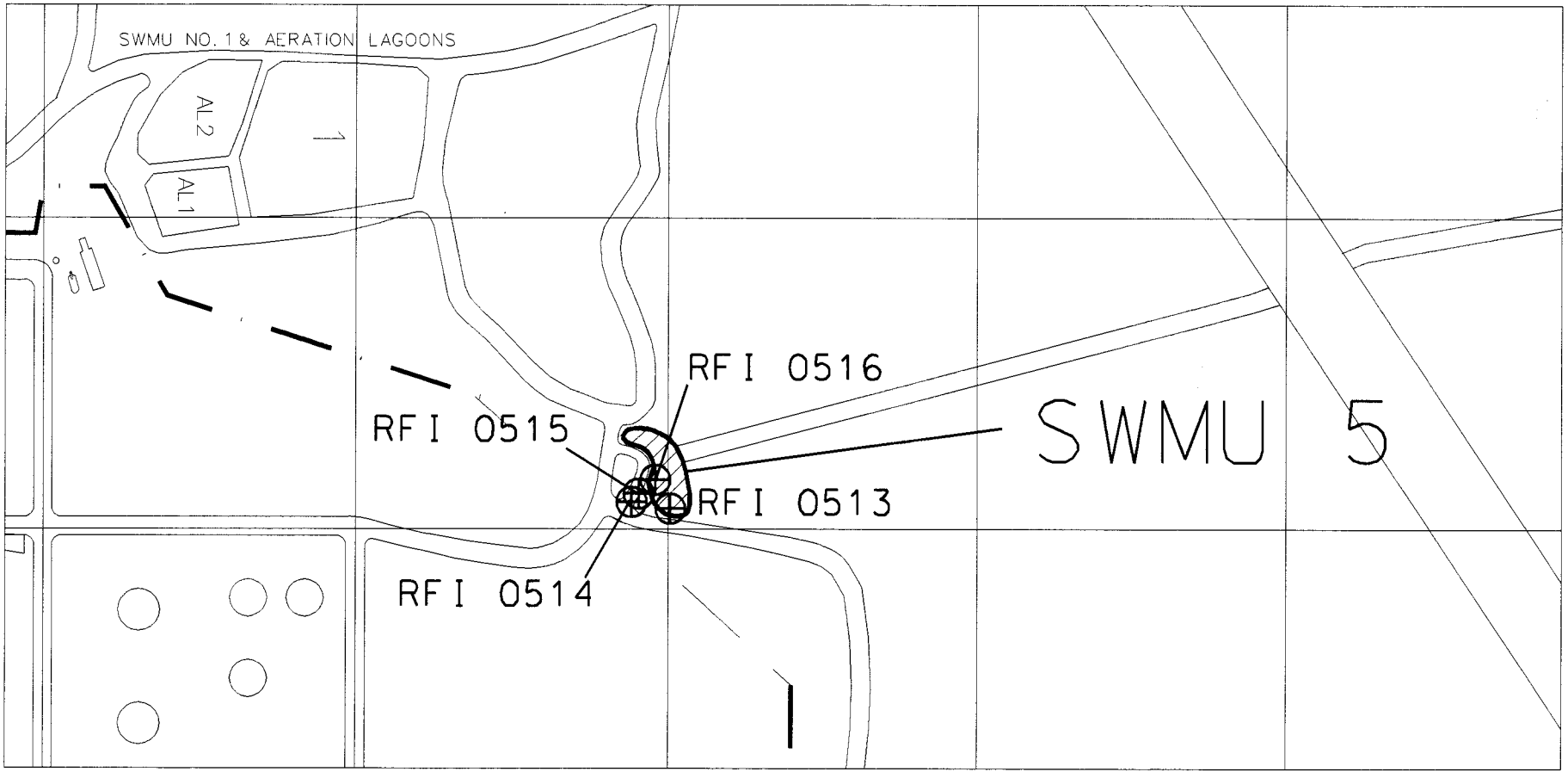
Surface Terrain: OPEN, MOSTLY FLAT, SCATTERED DEBRIS

Weather Conditions: CLEAR, 70°F, W WIND @ 5mph

General Field Observations:

Boring Lithology: 0-1.5' MIXED SOIL AND DEBRIS. 1.5'-5' RED CLAY/SAND MIX SOME DEBRIS. 5-5.5' ROCK/GRAVEL/SAND LAYER 5.5-6.5' RED CLAY/SAND. 6.5-7.0' ROCK/GRAVEL/SAND LAYER. 7.0-9.5' RED CLAY/SAND.

GIANT REFINING
CINIZA REFINERY
SWMU 5
LANDFILL AREA



SHEET 1 OF 7

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0513

Water Level NOT ENCOUNT. Date: 07/28/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
	0.5		/*/0*/		C	**CLAY**, SANDY, GRAVELLY, DRY, LOOSE, BROWN				
			/*/0*/		C					
			/*/0*/		C					
	2.0		/*/0*/		C					
			*0**0*	2.5	C	**SAND**, GRAVELLY(FINE), DRY TO DAMP, LOOSE, RED				
	2.8		*0**0*		C	BROWN, MISC. BLACK DEBRIS AS WOOD PIECES				
			*/**/*		C	**SAND**, CLAYEY, SOME MEDIUM GRAVEL, FILL, MOIST,				
			*/**/*		C	RED BROWN, BURNED WOOD AND GLASS DEBRIS, 4'-5'				
			*/**/*		C	APPEARS BURNED FROM 5 TO 6.1'				
			*/**/*	5	C					
			*/**/*		C					
	6.1		*/**/*		C					
			/-//-/		C	**CLAY**, SILTY, WET, FIRM, RED BROWN, OCCASIONAL				
			/-//-/		C	SANDY SEAMS 4" THICK(DRY)				
			/-//-/	7.5	C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	10	C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
	12.8		/-//-/		C					
	13.1		*/**/*		C	**SAND**, SILTY, MOIST, DENSE, MULTICOLORED, LAMINATED				
			*0**0*		C	**SAND**, GRAVELLY, MOIST, DENSE				
			*0**0*		C					
			*0**0*		C					
			*0**0*	15	C					
	15.4		*0**0*		C					
			/-//-/		C	**CLAY**, SILTY, WET, STIFF, RED, SAND SEAM AT 16'				
			/-//-/		C	AND 18'				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
	20.0		/-//-/	20	C	GRAVELLY AT 20'				
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

SHEET 2 OF 7 PRECISION ENGINEERING, INC. File No. 94-114

Boring Location _____ LOG OF TEST BORINGS Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0514 Water Level NOT ENCOUNT. Date: 07/28/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			//*///		C	**CLAY**, SILTY, SLIGHTY SANDY, MOIST, SOFT TO				
			//*///		C	FIRM, BROWN				
			//*///		C					
			//*///		C					
	2.5		//*///	2.5	C					
			/*//*/		C	**CLAY**, SANDY, SCATTERED FINE GRAVEL, FILL,				
			/*//*/		C	MOIST, BROWN, TRASH DEBRIS, PVC, RUBBER WASHER				
			/*//*/		C	WOOD, SOME METAL/ALUMINUM COATED WITH ASBESTOS				
			/*//*/		C					
			/*//*/	5	C					
			/*//*/		C					
			/*//*/		C					
	6.4		/*//*/		C					
			/-*/-*		C	**CLAY**, SILTY, SANDY, MOIST, STIFF, RED BROWN				
			/-*/-*	7.5	C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*	10	C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C	1" SAND SEAMS FROM 12.4' TO 13.4'				
	13.4		/-*/-*		C					
			******		C	**SAND**, FINE TO MEDIUM, LAMINATED, MOIST, DENSE,				
			******		C	BROWN TO MULTI COLORED				
	14.8		******	15	C					
			*0**0*		C	**SAND**, GRAVELLY, MOIST, DENSE, MULTI COLORED				
	15.8		*0**0*		C	GRAVEL, BROWN MATRIX, YELLOW SEAM AT 15.1'				
			//-///		C	**CLAY**, SLIGHTLY SILTY, WET, STIFF, RED				
			//-///		C					
			//-///		C					
			//-///		C					
			//-///		C					
			//-///		C					
			//-///		C					
			//-///	20	C					
			//-///							
			//-///							
	21.5		//-///							
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger Logged By: WHK

SHEET 3 OF 7 PRECISION ENGINEERING, INC. File No. 94-114

Boring Location _____ LOG OF TEST BORINGS Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0515 Water Level NOT ENCOUNT. Date: 07/28/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-/0-/		C	CLAY, SILTY, SCATTERED GRAVEL, MOIST, HARD,				
			/-//-/		C	BROWN				
	1.8		/-/0-/		C					
	2.1		******		C	SAND, MEDIUM, MOIST TO DAMP, DENSE, RED BROWN				
			/-*/-*	2.5	C	CLAY, SILTY, SANDY, OCCASIONAL GRAVEL, MOIST,				
			/-*/-*		C	HARD, BROWN				
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*	5	C					
	5.3		/-*/-*		C					
	6.2		/-//-/		C	CLAY, SILTY, WET, YELLOW STAIN, RED BROWN				
	6.5		*-/*-/		C	SAND, SILTY, CLAYEY,SOFT,BLACK, GRADES TO CLAY				
			//////		C	CLAY, WET, SOFT, RED BROWN, SOME BLACK				
			//////	7.5	C	MOTTLING				
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////	10	C					
	10.4		//////		C					
	10.6		FGFGFG		C	FIBERGLASS INSULATION				
			/*//*/		C	CLAY, SANDY, MOIST TO WET, SOFT, RED BROWN,				
			/*//*/		C	GRADES SANDIER				
			/*//*/		C					
			/*//*/		C					
			/*//*/		C					
			/*//*/		C					
			/*//*/		C					
			/*//*/	15	C					
			/*//*/		C					
	15.8		/*//*/		C					
			/-*/-*		C	CLAY, SILTY, SANDY, WET, SOFT, RED BROWN				
	17.1		/-*/-*		C					
			/-//*/		C	CLAY, SLIGHTLY SILTY, SLIGHTLY SANDY, WET,				
			/-//*/		C	STIFF TO HARD, RED BROWN				
			/-//*/		C					
			/-//*/		C					
			/-//*/		C					
	20.0		/-//*/	20	C	ONE 3" ROCK AT 19.7'				
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

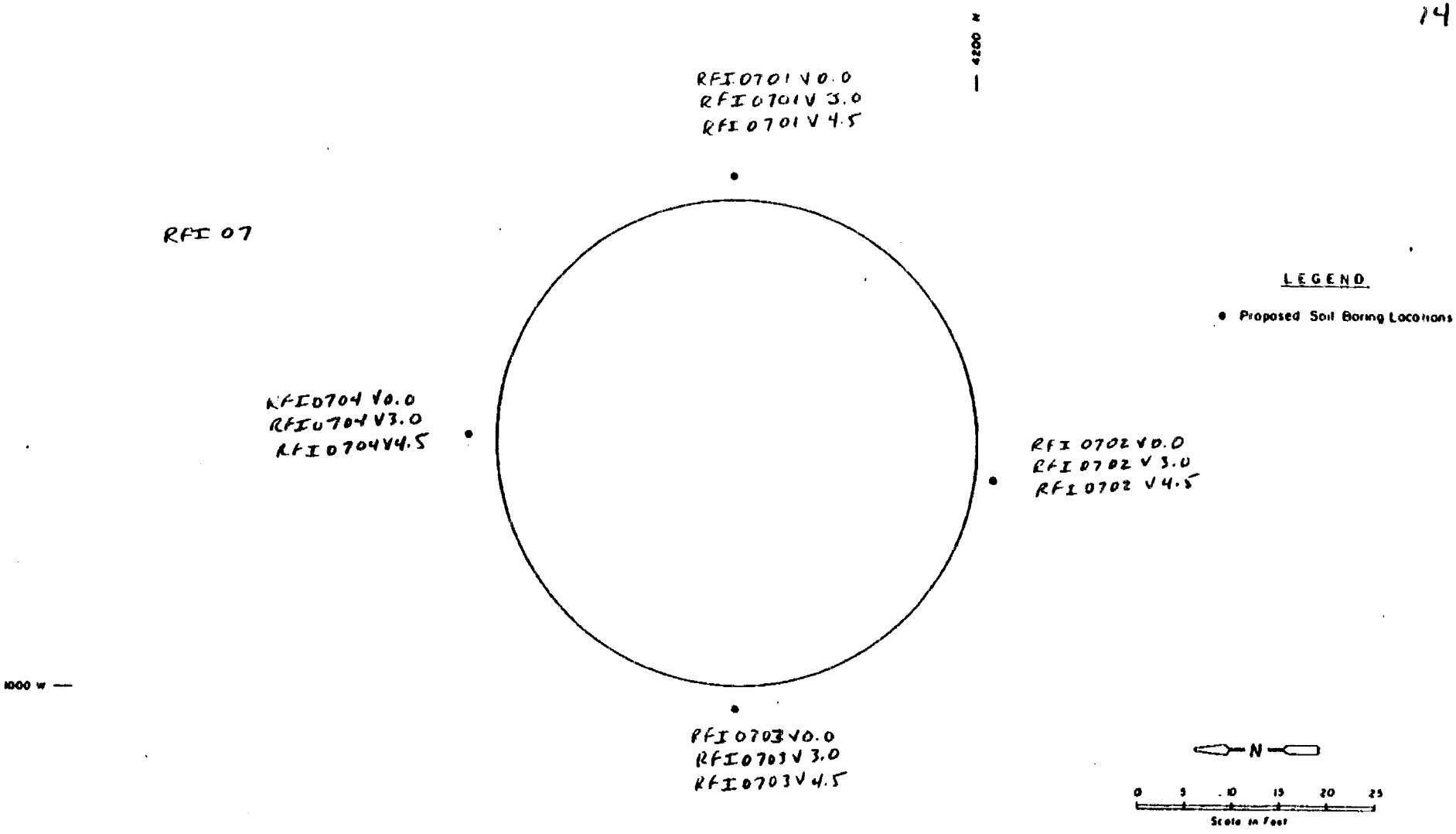
Boring Number: RFI 0516

Water Level NOT ENCOUNT. Date: 07/28/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-//-/		C	**CLAY**, SILTY, SOME CARBONATE NODULES, DAMP TO				
			/-/+-/		C	MOIST, HARD, BROWN, GRADES SANDIER				
			/-//-/		C					
			/-/+-/		C					
			/-//-/	2.5	C					
			/-//-/		C					
			/-/+-/		C					
			/-//-/		C					
			/-/+-/		C					
			/-//-/	5	C					
			/-//-/		C					
			/-/+-/		C					
			/-//-/		C					
			/-/+-/		C					
			/-//-/	7.5	C					
			/-//-/		C					
			/-/+-/		C					
	9.0		/-//-/		C					
			*0**0*		C	**SAND**, MULTICOLORED FINE GRAVEL, DRY TO DAMP,				
	10.2		*0**0*	10	C	DENSE				
			//-///		C	**CLAY**, SLIGHTLY SANDY, SOME CARBONATE NODULES,				
			//-/+/		C	SOME SAND PARTINGS, MOIST, HARD, BROWN,				
			//-///		C					
			//-///		C					
			//-/+/		C					
			//-///		C					
			//-/+/		C					
			//-///		C					
			//-///		C					
			//-/+/	15	C					
			//-///		C					
			//-/+/		C					
			//-///		C					
			//-///		C					
			//-/+/		C					
			//-///		C					
			//-/+/		C					
			//-///		C					
			//-///		C					
	20.0		//-///	20	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK



Applied Earth Sciences	NAME		FIGURE
FILE No. 5202 / MADE BY: R.G. DATE: 12-5-89 / CHECKED BY: DATE:	GIANT REFINERY Gallup, New Mexico	Fire Training Area	

DATA MANAGEMENT

Sample Location: SWMU # 7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0701V0.0 Sample Time/Description: 10:30 AM MOIST SOIL PID - 11

Sample No. RFI0701V3.0 Sample Time/Description: 10:45 AM MOIST SOIL PID - 4.2

Sample No. RFI0701V4.5 Sample Time/Description: 11:00 AM MOIST SOIL PID - .2

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLIGHT SLOPE, GRAVEL & SOIL SURFACE, MINUTE PLANT GROWTH

Weather Conditions: MOSTLY SUNNY, 65°F, LIGHT E WIND @ 1-5 MPH.

General Field Observations: _____

Boring Lithology: 0-1' - MIXED CLAY/SAND/GRAVEL. 1-27" DARK, MOSTLY CLAY. 27"-4.0' - RED CLAY 4-5 - RED/GRAY CLAY MIX

DATA MANAGEMENT

Sample Location: SWMU #7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0703V0.0 Sample Time/Description: 11:40 AM MOIST SOIL PID - .4

Sample No. RFI0703V3.0 Sample Time/Description: 11:50 AM MOIST SOIL PID - Ø

Sample No. RFI0703V4.5 Sample Time/Description: 11:55 AM MOIST SOIL PID - Ø

Sample No. _____ Sample Time/Description: _____

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLIGHT SLOPE, SOIL + GRAVEL SURFACE

Weather Conditions: PARTLY SUNNY, SSW WIND @ 3-5 MPH. 60°F.

General Field Observations: _____

Boring Lithology: 0-21" DARK DISCOLORED SOIL WITH SOME GRAVEL. 21" TO 5' RED/GRAY CLAY.

DATA MANAGEMENT

Sample Location: SWMU #7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0702 V0.0 Sample Time/Description: 11:00 AM MOIST SOIL PID - .4

Sample No. RFI0702V3.0 Sample Time/Description: 11:20 AM MOIST SOIL PID - 1.4

Sample No. RFI0702V4.5 Sample Time/Description: 11:30 AM MOIST CLAY PID - .3

Sample No. RFI0702D4.5 Sample Time/Description: 11:30 AM MOIST CLAY

Sample No. _____ Sample Time/Description: _____

Surface Terrain: SLOPE, SOIL & GRAVEL SURFACE

Weather Conditions: SEE 1ST PAGE WIND SWITCHING FROM E TO W

General Field Observations: OLD SMOKE CARTRIDGE FROM FIRE TRAINING, 5-5-92, STARTED SMOKING AGAIN AND COVERED AREA WITH SMOKE FOR ~ 3 MINUTES. DO NOT BELIEVE IT AFFECTED SAMPLES.

Boring Lithology: 0-1.5' DARK CLAY W/25% SAND AND SOME GRAVEL, 1.5 to 3.0' VERIGATED CLAYS, 3.0-5' RED/GRAY CLAY.

DATA MANAGEMENT

Sample Location: SWMU #7 Sample Date: 5-7-92

Sample Type: SOIL

Team Leader: L. SHELTON

Sample Personnel: M. BARNEY, T. ROGERS

Sampling Method: AUGER

Sample No. RFI0704V0.0 Sample Time/Description: 12:50 PM MOIST SOIL
PID 1.4

Sample No. RFI0704V3.0 Sample Time/Description: 1:05 PM MOIST SOIL
PID .8

Sample No. RFI0704V4.5 Sample Time/Description: 1:20 PM MOIST SOIL
PID .9

Sample No. RFI0704E4.5 Sample Time/Description: 1:25 PM WATER

Sample No. _____ Sample Time/Description: _____

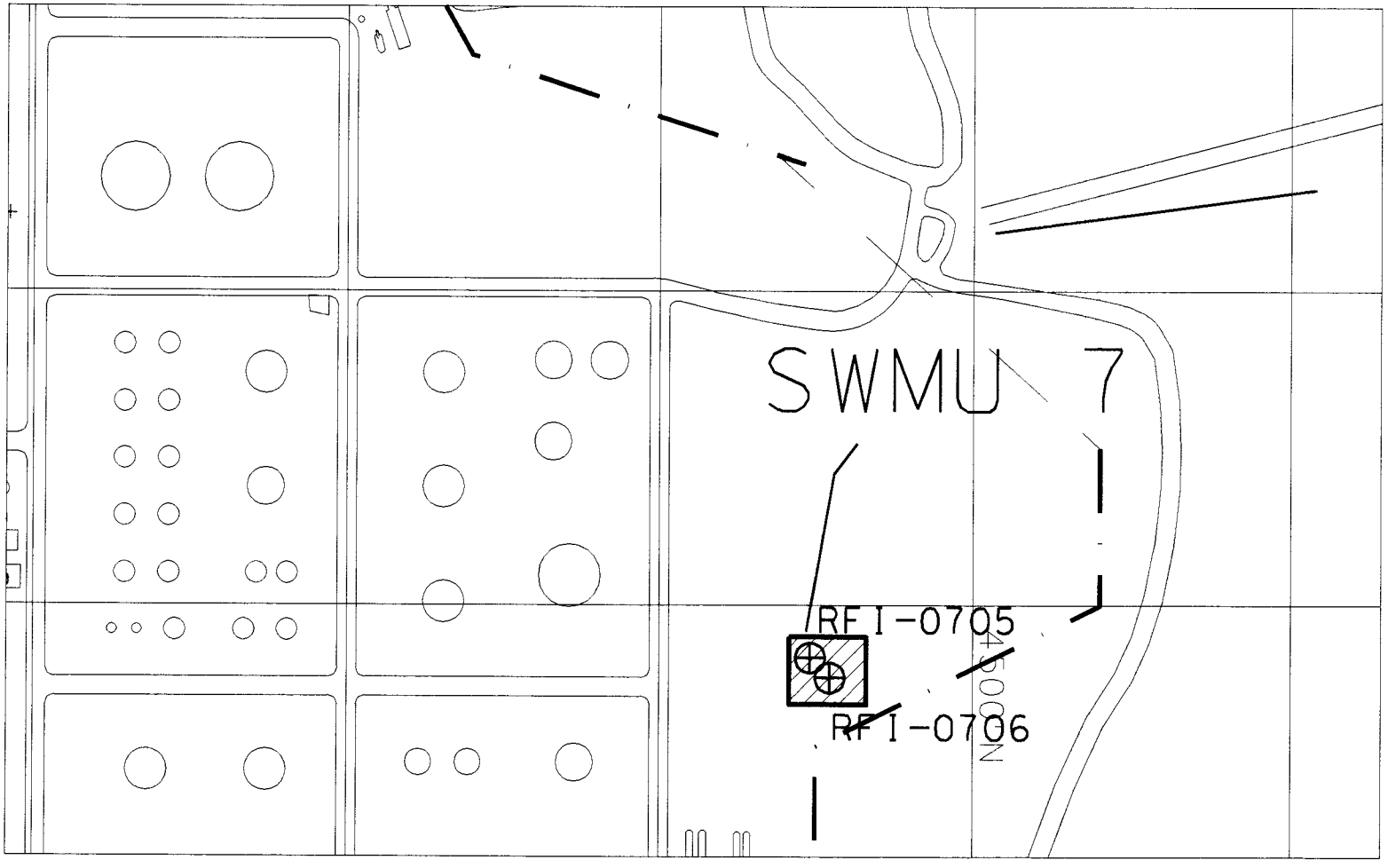
Surface Terrain: SLOPE, SOIL & GRAVEL SURFACE

Weather Conditions: CLOUDY, 55°F, WSW @ 5 MPH

General Field Observations: _____

Boring Lithology: 0-1' DISCOLORED SOIL/SAND W/GRAVEL, 14" TO 22" SLIGHTLY DISCOLORED SOIL. 22" TO 5' RED CLAY W/SOME WHITE SPECKING AT 4'-5'. 2" LAYER OF DARKER SOIL @ 4.0' LEVEL.

GIANT REFINING
CINIZA REFINERY
SWMU 7
FIRE TRAINING AREA



SHEET 1 OF 2

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0705

Water Level NOT ENCOUNT. Date: 08/11/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/0//0/		C	**CLAY**, GRAVELLY, WET, STIFF, BROWN, SOME BLACK				
			/0//0/		C	STREAKS				
			/0//0/		C					
	2.0		/0//0/		C					
			/*//*/	2.5	C	**CLAY**, SANDY, WET, STIFF, BROWN				
	3.0		/*//*/		C					
			//*///		C	**CLAY**, SLIGHTLY SANDY, WET, STIFF, BROWN,				
			//*///		C	BLOCKY, SOME CARBONATE NODULES AND CARBONATE				
			//*///		C	INFILLING				
			//*///	5	C					
			//*///		C					
			//*///		C					
	6.5		//*///		C					
			/*//*/		C	**CLAY**, SANDY, MOIST TO WET, STIFF, BROWN,				
	7.6		/*//*/	7.5	C	BLOCKY, 2" SAND SEAMS EVERY 7"				
			*/**/*		C	**SAND**, CLAYEY, MOIST TO WET, MODERATELY DENSE,				
			*/**/*		C	BROWN				
	8.8		*/**/*		C					
	9.5		**/***		C	**SAND**, SLIGHTLY CLAYEY, MOIST, MODERATELY DENSE				
			*0**0*	10	C	**SAND**, GRAVELLY(FINE), MOIST, DENSE, BROWN				
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
			*0**0*		C					
	12.3		*0**0*		C					
	TOTAL DEPTH									
				15						
				20						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

SHEET 2 OF 2

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 0706

Water Level NOT ENCOUNT. Date: 08/11/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/0/0		C	**SAND**, CLAYEY, GRAVELLY(UP TO 2"), MOIST, DENSE				
			/0/0		C	BROWN TO GREEN				
	1.5		*/0*/0		C					
			/0//0/		C	**CLAY**, GRAVELLYY, WET, STIFF, BROWN				
			/0//0/	2.5	C					
			/0//0/		C					
			/0//0/		C					
			/0//0/		C					
	4.5		/0//0/		C					
			//*///|	5	C	**CLAY**, SLIGHTY SANDY, MOIST, HARD, BROWN, FINE				
			//*///|		C	BLOCKY(< 0.5 CM), CARBONATE INFILLING IN				
			//*///|		C	JOINTS				
			//*///|		C					
			//*///|		C					
			//*///|	7.5	C					
	7.8		//*///|		C					
			/*//*/			C	**CLAY**, SANDY, MOIST TO WET, STIFF, BROWN				
			/*//*/			C					
	9.7		/*//*/			C					
	10.0		*0**0*	10		C	**SAND**, GRAVELLY(FINE), MOIST, DENSE, BROWN				
			//////			C	**CLAY**, WET, STIFF, BROWN				
			//////			C					
			//////			C					
	11.9		//////			C					
			/*//*/			C	**CLAY**, SANDY, WET, STIFF, BROWN				
	12.8		/*//*/			C					
	13.1		******			C	**SAND**, FINE, MOIST, LOOSE, BROWN				
	TOTAL DEPTH									
				15						
				20						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

LTH & drain

PFI09 - Inactive Land Treatment Area and Drainage

Sample point number		07	07	07	07		01
Depth of sample		V0.0	V3.0	V5.0	V7.0	-	E5.0
Parameter	Units	Result	Result	Result	Result	Units	Result
Total Metals							
Antimony	mg/kg	ND	ND	ND	ND	mg/L	ND
Arsenic	mg/kg	1.4	0.66	0.61	0.58	mg/L	ND
Barium	mg/kg	447	224	208	240	mg/L	ND
Beryllium	mg/kg	0.59	0.97	0.66	1.0	mg/L	ND
Cadmium	mg/kg	ND	ND	ND	ND	mg/L	ND
Chromium	mg/kg	102	8.6	16.2	7.6	mg/L	ND
Cobalt	mg/kg	1.2	2.9	1.5	2.5	mg/L	ND
Copper	mg/kg	10.5	5.5	4.1	5.1	mg/L	ND
Lead	mg/kg	14.0	9.1	7.2	7.5	mg/L	ND
Mercury	mg/kg	ND	ND	ND	ND	mg/L	ND
Nickel	mg/kg	6.0	7.7	4.7	6.8	mg/L	ND
Potassium	mg/kg	953	1020	776	1390	mg/L	ND
Selenium	mg/kg	ND	ND	ND	ND	mg/L	ND
Vanadium	mg/kg	14.6	13.1	10.3	12.7	mg/L	ND
Zinc	mg/kg	157	14.3	22.8	13.4	mg/L	ND

- add site plan

Sy [illegible] 9
[illegible] LTH
[illegible]

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		07	07	07	07		01
Depth of sample		V0.0	V3.0	V5.0	V7.0		E5.0
Parameter	Units	Result	Result	Result	Result	Units	Result
Method 8240							
Chloromethane	ug/kg	ND	ND	ND	ND	ug/L	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ug/L	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ug/L	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ug/L	ND
Methylene chloride	ug/kg	ND	ND	ND	ND	ug/L	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ug/L	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2-Dichloroethene (cis/trans)	ug/kg	ND	ND	ND	ND	ug/L	ND
Chloroform	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ug/L	ND
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ug/L	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ug/L	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ug/L	ND
trans-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ug/L	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ug/L	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ug/L	ND
1,1,2-Trichloroethene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzene	ug/kg	ND	ND	ND	ND	ug/L	ND
cis-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Chloroethyl vinyl ether	ug/kg	ND	ND	ND	ND	ug/L	ND
Bromoform	ug/kg	ND	ND	ND	ND	ug/L	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ug/L	ND
Tetrachloroethene	ug/kg	ND	ND	ND	ND	ug/L	ND
Toluene	ug/kg	ND	ND	ND	ND	ug/L	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ug/L	12
Acetone	ug/kg	ND	ND	ND	ND	ug/L	ND
Acrolein	ug/kg	ND	ND	ND	ND	ug/L	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ug/L	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ug/L	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ug/L	ND
trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ug/L	ND
Dichlorodifluoromethane	ug/kg	ND	ND	ND	ND	ug/L	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ug/L	ND
Ethanol	ug/kg	ND	ND	ND	ND	ug/L	ND
Iodomethane	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Butanone (MEK)	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND	ND	ND	ug/L	ND
Styrene	ug/kg	ND	ND	ND	ND	ug/L	ND
Trichlorofluoromethane	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ug/L	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ug/L	ND
Ethyl methacrylate	ug/kg	ND	ND	ND	ND		
Xylenes (total)	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Hexanone	ug/kg	ND	ND	ND	ND		

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		07	07	07	07		01
Depth of sample		V0.0	V3.0	V5.0	V7.0		E5.0
Parameter	Units	Result	Result	Result	Result	Units	Result
Method 8270							
Acenapthene	ug/kg	ND	ND	ND	ND	ug/L	ND
Acenaphthylene	ug/kg	ND	ND	ND	ND	ug/L	ND
Acetophenone	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Aminobiphenyl	ug/kg	ND	ND	ND	ND	ug/L	ND
Aniline	ug/kg	ND	ND	ND	ND	ug/L	ND
Anthracene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzo(b)fluoranthene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzo(k)fluoranthene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzo(g,h,i)perylene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzyl alcohol	ug/kg	ND	ND	ND	ND	ug/L	ND
bis(2-Chloroethoxy)-methane	ug/kg	ND	ND	ND	ND	ug/L	ND
bis(2-Chloroethyl) ether	ug/kg	ND	ND	ND	ND	ug/L	ND
bis(2-Chloroisopropyl)-ether	ug/kg	ND	ND	ND	ND	ug/L	ND
bis(2-Ethylhexyl) phthalate	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Bromophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ug/L	ND
Butyl benzyl phthalate	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Chloroaniline	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Chloro-3-methylphenol	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Chlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Chlorophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ug/L	ND
o-Cresol	ug/kg	ND	ND	ND	ND	ug/L	ND
m & p-Cresol(s)	ug/kg	ND	ND	ND	ND	ug/L	ND
Chrysene	ug/kg	ND	ND	ND	ND	ug/L	ND
Dibenz(a,h)anthracene	ug/kg	ND	ND	ND	ND	ug/L	ND
Di-n-butyl phthalate	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
3,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
2,4-Dichlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
2,6-Dichlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
Diethyl phthalate	ug/kg	ND	ND	ND	ND	ug/L	ND
p-Dimethylaminoazobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
7,12-Dimethylbenz(a)-	ug/kg	ND	ND	ND	ND	ug/L	ND
anthracene	ug/kg	ND	ND	ND	ND	ug/L	ND
a,a-Dimethylphenethyl-amine	ug/kg	ND	ND	ND	ND	ug/L	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ug/L	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ug/L	ND
1,3-Dinitrobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
4,6-Dinitro-o-cresol	ug/kg	ND	ND	ND	ND	ug/L	ND
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
2,4-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ug/L	ND
2,6-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ug/L	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ug/L	ND
Diphenylamine	ug/kg	ND	ND	ND	ND	ug/L	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		07	07	07	07		01
Depth of sample		V0.0	V3.0	V5.0	V7.0		E5.0
Parameter	Units	Result	Result	Result	Result	Units	Result
Method 8270 (con't)							
Ethyl methanesulfonate	ug/kg	ND	ND	ND	ND	ug/L	ND
Fluoranthene	ug/kg	ND	ND	ND	ND	ug/L	ND
Fluorene	ug/kg	ND	ND	ND	ND	ug/L	ND
Hexachlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
Hexachlorobutadiene	ug/kg	ND	ND	ND	ND	ug/L	ND
Hexachlorocyclopentadiene	ug/kg	ND	ND	ND	ND	ug/L	ND
Hexachloroethane	ug/kg	ND	ND	ND	ND	ug/L	ND
Indeno(1,2,3-cd)pyrene	ug/kg	ND	ND	ND	ND	ug/L	ND
Isophorone	ug/kg	ND	ND	ND	ND	ug/L	ND
3-Methylcholanthrene	ug/kg	ND	ND	ND	ND	ug/L	ND
Methyl methanesulfonate	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ug/L	ND
Naphthalene	ug/kg	ND	ND	ND	ND	ug/L	ND
1-Naphthylamine	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Naphthylamine	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Nitroaniline	ug/kg	ND	ND	ND	ND	ug/L	ND
3-Nitroaniline	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Nitroaniline	ug/kg	ND	ND	ND	ND	ug/L	ND
Nitrobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Nitrophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
4-Nitrophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
N-Nitroso-di-n-butylamine	ug/kg	ND	ND	ND	ND	ug/L	ND
N-Nitrosodimethylamine	ug/kg	ND	ND	ND	ND	ug/L	ND
N-Nitrosodiphenylamine	ug/kg	ND	ND	ND	ND	ug/L	ND
N-Nitroso-di-n-propylamine	ug/kg	ND	ND	ND	ND	ug/L	ND
N-Nitrosopiperidine	ug/kg	ND	ND	ND	ND	ug/L	ND
Pentachlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
Pentachloronitrobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
Pentachlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
Phenacetin	ug/kg	ND	ND	ND	ND	ug/L	ND
Phenanthrene	ug/kg	ND	ND	ND	ND	ug/L	ND
Phenol	ug/kg	ND	ND	ND	ND	ug/L	ND
2-Picoline	ug/kg	ND	ND	ND	ND	ug/L	ND
Pronamide	ug/kg	ND	ND	ND	ND	ug/L	ND
Pyrene	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2,4,5-Tetrachloro-benzene	ug/kg	ND	ND	ND	ND	ug/L	ND
2,3,4,6-Tetrachlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2,4-Trichlorobenzene	ug/kg	ND	ND	ND	ND	ug/L	ND
2,4,5-Trichlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
2,4,6-Trichlorophenol	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzidine	ug/kg	ND	ND	ND	ND	ug/L	ND
Benzoic acid	ug/kg	ND	ND	ND	ND	ug/L	ND
1-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ug/L	ND
1,2-Diphenylhydrazine	ug/kg	ND	ND	ND	ND	ug/L	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		06	06	06	06	06
Depth of sample		V0.0	V3.0	D3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Total Metals						
Antimony	mg/kg	ND	ND	ND	ND	ND
Arsenic	mg/kg	1.7	1.2	ND	ND	0.53
Barium	mg/kg	299	243	226	241	319
Beryllium	mg/kg	0.79	1.1	1.1	0.97	0.97
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chromium	mg/kg	7.8	6.3	6.3	5.1	4.1
Cobalt	mg/kg	2.3	2.6	2.6	1.9	1.7
Copper	mg/kg	14.3	5.4	5.4	4.5	4.9
Lead	mg/kg	28.1	9.2	8.1	7.5	8.1
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	11.4	7.0	7.2	5.3	5.0
Potassium	mg/kg	989	1110	1120	997	828
Selenium	mg/kg	ND	ND	ND	ND	ND
Vanadium	mg/kg	14.5	14.5	14.2	12.6	13.0
Zinc	mg/kg	22.8	10.6	10.4	8.4	7.8

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		06	06	06	06	06
Depth of sample		V0.0	V3.0	D3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Method 8270 (con't)						
Ethyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND
Fluoranthene	ug/kg	ND	ND	ND	ND	ND
Fluorene	ug/kg	ND	ND	ND	ND	ND
Hexachlorobenzene	ug/kg	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/kg	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/kg	ND	ND	ND	ND	ND
Hexachloroethane	ug/kg	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/kg	ND	ND	ND	ND	ND
Isophorone	ug/kg	ND	ND	ND	ND	ND
3-Methylcholanthrene	ug/kg	ND	ND	ND	ND	ND
Methyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND
2-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ND
Naphthalene	ug/kg	ND	ND	ND	ND	ND
1-Naphthylamine	ug/kg	ND	ND	ND	ND	ND
2-Naphthylamine	ug/kg	ND	ND	ND	ND	ND
2-Nitroaniline	ug/kg	ND	ND	ND	ND	ND
3-Nitroaniline	ug/kg	ND	ND	ND	ND	ND
4-Nitroaniline	ug/kg	ND	ND	ND	ND	ND
Nitrobenzene	ug/kg	ND	ND	ND	ND	ND
2-Nitrophenol	ug/kg	ND	ND	ND	ND	ND
4-Nitrophenol	ug/kg	ND	ND	ND	ND	ND
N-Nitroso-di-n-butylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitrosodimethylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitrosopiperidine	ug/kg	ND	ND	ND	ND	ND
Pentachlorobenzene	ug/kg	ND	ND	ND	ND	ND
Pentachloronitrobenzene	ug/kg	ND	ND	ND	ND	ND
Pentachlorophenol	ug/kg	ND	ND	ND	ND	ND
Phenacetin	ug/kg	ND	ND	ND	ND	ND
Phenanthrene	ug/kg	ND	ND	ND	ND	ND
Phenol	ug/kg	ND	ND	ND	ND	ND
2-Picoline	ug/kg	ND	ND	ND	ND	ND
Pronamide	ug/kg	ND	ND	ND	ND	ND
Pyrene	ug/kg	20000	ND	ND	ND	ND
1,2,4,5-Tetrachloro-benzene	ug/kg	ND	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	ug/kg	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/kg	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND
Benzidine	ug/kg	ND	ND	ND	ND	ND
Benzoic acid	ug/kg	ND	ND	ND	ND	ND
1-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine	ug/kg	ND	ND	ND	ND	ND

PFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		06	06	06	06	06
Depth of sample		V0.0	V3.0	D3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Method 8270						
Acenapthene	ug/kg	ND	ND	ND	ND	ND
Acenaphthylene	ug/kg	ND	ND	ND	ND	ND
Acetophenone	ug/kg	ND	ND	ND	ND	ND
4-Aminobiphenyl	ug/kg	ND	ND	ND	ND	ND
Aniline	ug/kg	ND	ND	ND	ND	ND
Anthracene	ug/kg	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ug/kg	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ug/kg	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ug/kg	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND	ND	ND
Benzyl alcohol	ug/kg	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)-methane	ug/kg	ND	ND	ND	ND	ND
bis(2-Chloroethyl) ether	ug/kg	ND	ND	ND	ND	ND
bis(2-Chloroisopropyl)-ether	ug/kg	ND	ND	ND	ND	ND
bis(2-Ethylhexyl) phthalate	ug/kg	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND
Butyl benzyl phthalate	ug/kg	ND	ND	ND	ND	ND
4-Chloroaniline	ug/kg	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	ug/kg	ND	ND	ND	ND	ND
2-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND
2-Chlorophenol	ug/kg	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND
o-Cresol	ug/kg	ND	ND	ND	ND	ND
m & p-Cresol(s)	ug/kg	26000	ND	ND	ND	ND
Chrysene	ug/kg	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ug/kg	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ug/kg	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
3,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
2,4-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND
2,6-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND
Diethyl phthalate	ug/kg	ND	ND	ND	ND	ND
p-Dimethylaminoazobenzene	ug/kg	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)-anthracene	ug/kg	ND	ND	ND	ND	ND
a,a-Dimethylphenethyl-amine	ug/kg	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	ug/kg	ND	ND	ND	ND	ND
4,6-Dinitro-o-cresol	ug/kg	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ND
Diphenylamine	ug/kg	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		06	06	06	06	06
Depth of sample		V0.0	V3.0	D3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Method 8240						
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Methylene chloride	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethene (cis/trans)	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrachloroethene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Iodomethane	ug/kg	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/kg	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND
Ethyl methacrylate	ug/kg	ND	ND	ND	ND	ND
Xylenes (total)	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND

RF109 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		05	05	05	05	05
Depth of sample		V0.0	V3.0	V5.0	D5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Total Metals						
Antimony	mg/kg	ND	ND	ND	ND	ND
Arsenic	mg/kg	ND	ND	ND	ND	ND
Barium	mg/kg	285	418	333	375	313
Beryllium	mg/kg	1.2	0.77	0.94	0.91	1.3
Cadmium	mg/kg	ND	ND	ND	ND	ND
Chromium	mg/kg	8.1	32.2	6.1	6.8	8.5
Cobalt	mg/kg	4.6	5.0	3.5	3.9	4.5
Copper	mg/kg	5.5	11.9	3.5	4.2	6.4
Lead	mg/kg	14.9	31.0	13.7	14.4	12.8
Mercury	mg/kg	ND	ND	ND	ND	ND
Nickel	mg/kg	9.1	8.7	5.5	6.9	9.2
Potassium	mg/kg	1160	1100	925	936	1590
Selenium	mg/kg	ND	ND	ND	ND	ND
Vanadium	mg/kg	17.9	16.9	15.5	16.4	19.5
Zinc	mg/kg	12.1	55.6	8.4	10.1	13.3

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		05	05	05	05	05
Depth of sample		V0.0	V3.0	V5.0	D5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Method 8270 (con't)						
Ethyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND
Fluoranthene	ug/kg	ND	ND	ND	ND	ND
Fluorene	ug/kg	ND	ND	ND	ND	ND
Hexachlorobenzene	ug/kg	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/kg	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/kg	ND	ND	ND	ND	ND
Hexachloroethane	ug/kg	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/kg	ND	ND	ND	ND	ND
Isophorone	ug/kg	ND	ND	ND	ND	ND
3-Methylcholanthrene	ug/kg	ND	ND	ND	ND	ND
Methyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND
2-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ND
Naphthalene	ug/kg	ND	ND	ND	ND	ND
1-Naphthylamine	ug/kg	ND	ND	ND	ND	ND
2-Naphthylamine	ug/kg	ND	ND	ND	ND	ND
2-Nitroaniline	ug/kg	ND	ND	ND	ND	ND
3-Nitroaniline	ug/kg	ND	ND	ND	ND	ND
4-Nitroaniline	ug/kg	ND	ND	ND	ND	ND
Nitrobenzene	ug/kg	ND	ND	ND	ND	ND
2-Nitrophenol	ug/kg	ND	ND	ND	ND	ND
4-Nitrophenol	ug/kg	ND	ND	ND	ND	ND
N-Nitroso-di-n-butylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitrosodimethylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	ug/kg	ND	ND	ND	ND	ND
N-Nitrosopiperidine	ug/kg	ND	ND	ND	ND	ND
Pentachlorobenzene	ug/kg	ND	ND	ND	ND	ND
Pentachloronitrobenzene	ug/kg	ND	ND	ND	ND	ND
Pentachlorophenol	ug/kg	ND	ND	ND	ND	ND
Phenacetin	ug/kg	ND	ND	ND	ND	ND
Phenanthrene	ug/kg	ND	ND	ND	ND	ND
Phenol	ug/kg	ND	ND	ND	ND	ND
2-Picoline	ug/kg	ND	ND	ND	ND	ND
Pronamide	ug/kg	ND	ND	ND	ND	ND
Pyrene	ug/kg	ND	ND	ND	ND	ND
1,2,4,5-Tetrachloro-benzene	ug/kg	ND	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	ug/kg	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/kg	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND
Benzidine	ug/kg	ND	ND	ND	ND	ND
Benzoic acid	ug/kg	ND	ND	ND	ND	ND
1-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine	ug/kg	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		05	05	05	05	05
Depth of sample		V0.0	V3.0	V5.0	D5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Method 8270						
Acenapthene	ug/kg	ND	ND	ND	ND	ND
Acenaphthylene	ug/kg	ND	ND	ND	ND	ND
Acetophenone	ug/kg	ND	ND	ND	ND	ND
4-Aminobiphenyl	ug/kg	ND	ND	ND	ND	ND
Aniline	ug/kg	ND	ND	ND	ND	ND
Anthracene	ug/kg	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ug/kg	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ug/kg	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ug/kg	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND	ND	ND
Benzyl alcohol	ug/kg	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)-methane	ug/kg	ND	ND	ND	ND	ND
bis(2-Chloroethyl) ether	ug/kg	ND	ND	ND	ND	ND
bis(2-Chloroisopropyl)-ether	ug/kg	ND	ND	ND	ND	ND
bis(2-Ethylhexyl) phthalate	ug/kg	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND
Butyl benzyl phthalate	ug/kg	ND	ND	ND	ND	ND
4-Chloroaniline	ug/kg	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	ug/kg	ND	ND	ND	ND	ND
2-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND
2-Chlorophenol	ug/kg	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND
o-Cresol	ug/kg	ND	ND	ND	ND	ND
m & p-Cresol(s)	ug/kg	ND	ND	ND	ND	ND
Chrysene	ug/kg	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ug/kg	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ug/kg	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
3,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND
2,4-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND
2,6-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND
Diethyl phthalate	ug/kg	ND	ND	ND	ND	ND
p-Dimethylaminoazobenzene	ug/kg	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)-	ug/kg	ND	ND	ND	ND	ND
anthracene	ug/kg	ND	ND	ND	ND	ND
a,a-Dimethylphenethyl-amine	ug/kg	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	ug/kg	ND	ND	ND	ND	ND
4,6-Dinitro-o-cresol	ug/kg	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ND
Diphenylamine	ug/kg	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		05	05	05	05	05
Depth of sample		V0.0	V3.0	V5.0	D5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result
Method 8240						
Chloromethane	ug/kg	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND
Methylene chloride	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethene (cis/trans)	ug/kg	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND
1,1,2-Trichloroethene	ug/kg	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ug/kg	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND
Tetrachloroethene	ug/kg	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/kg	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND
Iodomethane	ug/kg	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/kg	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/kg	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND
Ethyl methacrylate	ug/kg	ND	ND	ND	ND	ND
Xylenes (total)	ug/kg	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		03	03	03	03 -	04	04	04	04
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Total Metals									
Antimony	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	mg/kg	ND	ND	ND	0.58	2.1	ND	ND	ND
Barium	mg/kg	214	307	334	224	406	275	309	239
Beryllium	mg/kg	0.73	1.0	1.2	1.1	0.91	1.3	1.1	1.4
Cadmium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	mg/kg	4.9	6.1	7.6	7.6	12.3	6.7	5.2	8.1
Cobalt	mg/kg	1.6	2.1	3.4	3.2	4.4	4.1	3.4	4.8
Copper	mg/kg	4.5	4.8	8.6	5.8	13.9	6.5	5.2	7.2
Lead	mg/kg	6.0	8.0	9.9	7.3	29.7	13.8	12.4	16.4
Mercury	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/kg	5.1	6.7	9.1	8.2	10.0	7.4	5.1	7.8
Potassium	mg/kg	991	955	1300	1860	1250	1100	993	1560
Selenium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg	10.1	13.1	16.1	14.9	16.4	16.4	12.8	18.1
Zinc	mg/kg	8.7	9.6	13.4	13.3	69.6	11.1	9.1	14.0

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		03	03	03	03	04	04	04	04
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Method 8270 (con't)									
Ethyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Methyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1-Naphthylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Naphthylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-butylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodimethylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosopiperidine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pentachloronitrobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Phenacetin	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Picoline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pronamide	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetrachloro-benzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic acid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		03	03	03	03	04	04	04	04
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Method 8270									
Acenapthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Aminobiphenyl	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Aniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl alcohol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)-methane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethyl) ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroisopropyl)-ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl) phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
o-Cresol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
m & p-Cresol(s)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
3,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
p-Dimethylaminoazobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)-	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
a,a-Dimethylphenethyl-amine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-o-cresol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Diphenylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		03	03	03	03	04	04	04	04
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Method 8240									
Chloromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (cis/trans)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	ND	ND	ND	ND	20000	22000	12000
Iodomethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl methacrylate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		01	01	01	01	02	02	02	02
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Total Metals									
Antimony	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	mg/kg	0.86	ND	ND	ND	ND	ND	ND	ND
Barium	mg/kg	316	330	332	309	302	318	237	262
Beryllium	mg/kg	0.95	0.88	1.1	1.2	1.3	1.2	1.2	0.59
Cadmium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	mg/kg	13.9	4.8	5.4	5.4	11.8	6.3	7.2	2.3
Cobalt	mg/kg	3.2	2.8	3.8	4.0	5.8	3.7	4.4	2.0
Copper	mg/kg	7.4	3.6	5.3	5.7	9.1	5.6	5.7	ND
Lead	mg/kg	13.4	11.4	9.8	13.2	16.1	13.9	13.4	11.9
Mercury	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	mg/kg	6.3	5.2	5.7	6.7	11.4	6.8	8.2	ND
Potassium	mg/kg	1210	712	1400	963	2110	1220	1640	ND
Selenium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Vanadium	mg/kg	12.9	12.9	14.1	14.7	20.4	16.0	15.9	9.5
Zinc	mg/kg	19.7	6.9	9.3	9.2	18.4	12.0	12.3	5.7

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		01	01	01	01	02	02	02	02
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Method 8270 (con't)									
Ethyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
3-Methylcholanthrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Methyl methanesulfonate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1-Naphthylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Naphthylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
3-Nitroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitrophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Nitrophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-butylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodimethylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitroso-di-n-propylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosopiperidine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pentachloronitrobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Phenacetin	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Picoline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pronamide	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4,5-Tetrachloro-benzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzidine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic acid	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Diphenylhydrazine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

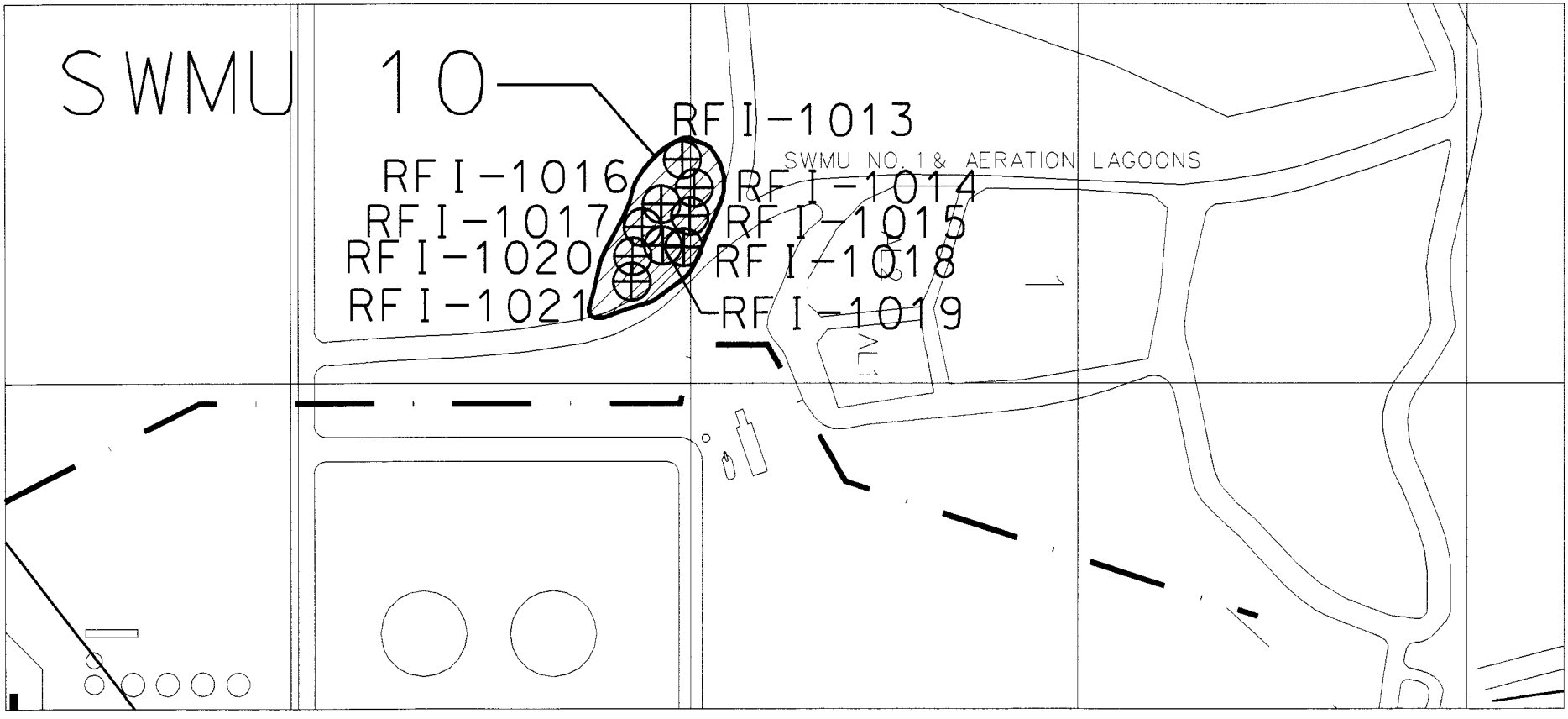
RFI09 - Inactive Land atment Area and Drainage Ditch

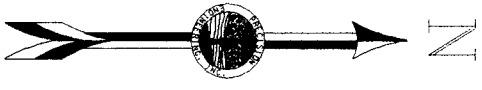
Sample point number		01	01	01	01	02	02	02	02
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Method 8270									
Acenarthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acenarhthylene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acetophenone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Aminobiphenyl	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Aniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(k)fluoranthene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl alcohol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethoxy)-methane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroethyl) ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Chloroisopropyl)-ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl) phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Butyl benzyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloroaniline	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
o-Cresol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
m & p-Cresol(s)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
3,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dichlorophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Diethyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
p-Dimethylaminoazobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
7,12-Dimethylbenz(a)-	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
anthracene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
a,a-Dimethylphenethyl-amine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dimethylphenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dimethyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dinitrobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4,6-Dinitro-o-cresol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octyl phthalate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Diphenylamine	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

RFI09 - Inactive Land Treatment Area and Drainage Ditch

Sample point number		01	01	01	01	02	02	02	02
Depth of sample		V0.0	V3.0	V5.0	V7.0	V0.0	V3.0	V5.0	V7.0
Parameter	Units	Result	Result	Result	Result	Result	Result	Result	Result
Method 8240									
Chloromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (cis/trans)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Ethanol	ug/kg	ND	16000	ND	24000	ND	23000	ND	ND
Iodomethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl acetate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl methacrylate	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ug/kg	ND	ND	ND	ND	ND	ND	ND	ND

GIANT REFINING
CINIZA REFINERY
SWMU 10
SLUDGE PITS





SHEET 1 OF 9

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1013

Water Level NOT ENCOUNT. Date: 07/26/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/*/0*/		C	**CLAY**, SANDY, SLIGHTLY GRAVELLY, DAMP, SOFT,				
			/*/0*/		C	RED BROWN				
			/*/0*/		C					
	2.0		/*/0*/		C					
			/-//-/	2.5	C	**CLAY**, SILTY, WET, SOFT, MOTTLED BLACK				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	5	C					
	5.5		/-//-/		C					
			/*//*/		C	**CLAY**, SANDY(MEDIUM), WET, BROWN				
	6.4		/*//*/		C					
	6.8		*-**-*		C	**SAND**, FINE, SILTY, WET, SHARP CONTACTS				
			/-//-/	7.5	C	**CLAY**, SILTY, WET, SOFT, RED BROWN, SOME DARK				
			/-//-/		C	STAINING IN THIN VARIED SILTY LENSES				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	10	C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
	12.3		/-//-/		C					
			/*-/*-		C	**CLAY**, SANDY(FINE), SILTY, MOIST TO WET, FIRM,				
			/*-/*-		C	RED BROWN, THIN BEDDING PLANES(< 1 CM)				
			/*-/*-		C					
			/*-/*-		C					
			/*-/*-	15	C	GRADES LESS SANDY				
			/*-/*-		C					
	15.8		/*-/*-		C					
	16.6		/-//-/		C	**CLAY**, SILTY, WET, FIRM, RED BROWN				
			/S//S/		C	**CLAY**, SHALEY, MOIST TO WET, FISSLE, DARK RED				
			/S//S/		C	BROWN, GREY SANDY STREAKS, MORE MASSIVE AND				
			/S//S/		C	SANDY BELOW 18.3'				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	20.0		/S//S/	20	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1014

Water Level NOT ENCOUNT. Date: 07/26/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-*/-*		C	**CLAY**, SILTY, SANDY(FINE),MOIST, SOFT,RED BROWN				
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*	2.5	C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*	5.0	C					
			/-*/-*		C					
			/-*/-*		C					
	6.5		/-*/-*		C					
	7.0		/-//-/		C	**CLAY**, SILTY, WET, SOFT, RED BROWN				
			/-*/-*	7.5	C	**CLAY**, SILTY, SANDY, WET, SOFT, 7 TO 8.5' BLACK				
			/-*/-*		C	8.5 TO 10' RED BROWN				
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
	10.0		/-*/-*	10	C					
			/-//-/		C	**CLAY**, SILTY, WET, SOFT, RED BROWN				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
	13.1		/-//-/		C					
			-*--*-		C	**SILT**, SANDY, WET, SOFT, RED TO DARK BROWN				
	13.8		-*--*-		C					
			/-//-/		C	**CLAY**, SILTY, WET, SOFT, RED BROWN, 1" SAND				
	15.1		/-//-/	15	C	SEAM AT 14.6'				
	15.7		*/**/*		C	**SAND**, CLAYEY, WET, LOOSE, BROWN				
			/-//-/		C	**CLAY**, SILTY, WET, FIRM, RED BROWN				
			/-//-/		C	GRADES SHALEY				
	17.0		/-//-/		C					
			/S//S/		C	**CLAY**, SHALEY, DAMP TO MOIST, HARD, RED BROWN,				
			/S//S/		C	THIN GREY SILTY STREAKS(FEW BELOW 18.5')				
			/S//S/		C					
			/S*/S/		C	GRADES SANDY AND BLOCKY				
			/S*/S/		C					
			/S*/S/	20	C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C	SLICKEN SIDED JOINT AT 24.1				
	25.0		/S*/S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1015

Water Level NOT ENCOUNT. Date: 07/26/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-*/-*		C	CLAY, SILTY, SANDY(FINE), OCCASIONAL GRAVEL,				
			/-*/-*		C	MOIST TO WET, SOFT, BROWN				
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*	2.5	C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
	4.5		/-*/-*		C					
			/-/0-/	5.0	C	CLAY, SILTY, SCATTERED FINE GRAVEL, WET, VERY				
			/-/0-/		C	SOFT, BLACK				
			/-/0-/		C					
	6.5		/-/0-/		C					
			/*//*/		C	CLAY, SANDY, WET, VERY SOFT, WHERE SANDY FREE				
			/*//*/	7.5	C	FLUID AND BLACK				
			/*//*/		C	3.6" CLAY ZONES AT 7.5', BLACK BROWN				
			/*//*/		C					
			/*//*/		C					
			/*//*/		C					
			/*//*/	10	C					
	10.4		/*//*/		C					
			/-//-/		C	CLAY, SILTY, SOFT, RED BROWN				
			/-//-/		C					
			/-//-/		C					
	12.4		/-//-/		C					
			/-//-/		C	CLAY, SILTY, WET, SOFT, RED BROWN, INTERBEDDED				
			/-//-/		C	SILTS & FINE SAND(BLACK STAIN)				
			/-//-/		C					
			/-//-/		C					
	15.0		/-//-/	15	C					
			/*/*/*		C	CLAY, VERY SANDY, RED BROWN, GRADES SANDIER				
			/*/*/*		C					
			/*/*/*		C					
	17.0		/*/*/*		C					
			/S//S/		C	CLAY, SHALEY, MOIST, HARD, RED BROWN, WEAK				
			/S//S/		C	LAMINATIONS AT ~ 1 CM INTERVALS, GREY IS CLAY,				
			/S//S/		C	FISSILE TO BLOCKY, OCCASIONAL THIN SANDIER				
			/S//S/		C	SEAMS(<4")				
			/S//S/		C					
			/S//S/	20	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	25.0		/S//S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1016

Water Level NOT ENCOUNT. Date: 07/26/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
			/-//-/		C	**CLAY**, SILTY, OCCASIONAL FINE GRAVEL, MOIST,				
			/-//-/		C	SOFT TO FIRM, BROWN				
			/-//-/		C					
			/-//-/		C					
			/-//-/	2.5	C					
			/-//-/		C					
	3.3		/-//-/		C					
			-/-/-/		C	**SILT/CLAY**, WET, VERY SOFT, BLACK				
			/-/-/-		C					
			-/-/-/	5.0	C					
			/-/-/-		C					
	5.8		-/-/-/		C					
			/-//-/		C	**CLAY**, SILTY, WET, VERY SOFT, BLACK MOTTLING				
			/-//-/		C					
			/-//-/	7.5	C					
			/-//-/		C					
			/-//-/		C					
	9.1		/-//-/		C					
			*/**/*		C	**SAND**, CLAYEY, WET, VERY LOOSE, BROWN				
	9.8		*/**/*	10	C					
			//////		C	**CLAY**, WET, SOFT, SOME SAND LENSES(<1 CM)				
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////	15	C					
			//////		C					
			//////		C					
			//////		C					
	16.9		//////		C					
			/S//S/		C	**CLAY**, SHALEY, MOIST, HARD, RED, SOME GREY CLAY				
			/S//S/		C	MOTTLING, FISSILE TO BLOCKY(<1 CM)				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/	20	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	25.0		/S//S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1017

Water Level NOT ENCOUNT. Date: 07/26/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-*/-*		C	CLAY, SILTY, SANDY, DAMP TO MOIST, FIRM, BROWN				
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
	2.5		/-*/-*	2.5	C					
			/-*/-*		C	CLAY, SILTY, SANDY, WET, VERY SOFT, BLACK				
			/-*/-*		C	BROWN MOTTLED, BLACK FROM 4 TO 6'				
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*	5.0	C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C	SOME FINE GRAVEL AT 6' AND SCATTERED BLACK				
			/-*/-*		C	BROWN MOTTLING				
			/-*/-*	7.5	C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
			/-*/-*		C					
	10.0		/-*/-*	10	C					
			/0//0/		C	CLAY, GRAVELLY, WET, LOOSE, RED BROWN, SOME				
	11.1		/0//0/		C	FREE FLUID				
			//////		C	CLAY, WET, FIRM, RED BROWN				
			//////		C					
			//////		C					
	12.8		//////		C					
	13.4		******		C	SAND, FINE, WET, LOOSE, BROWN TO GREY				
			/-//-/		C	CLAY, SILTY, WET, SOFT, RED BROWN, WEAK				
			/-//-/		C	MOTTLING(BLACK SPECKS), GRADES LESS SILTY				
			/-//-/	15	C					
			/-//-/		C					
	15.8		/-//-/		C					
			//////		C	CLAY, WET, FIRM, RED				
	16.8		//////		C					
			/S//S/		C	CLAY, SHALEY, RED, SOME GREY CLAY MOTTLING,				
			/S//S/		C	FISSILE TO FINE BLOCKY(<1 CM), SOME RED/GREY				
			/S//S/		C	LAMINATIONS				
			/S//S/		C					
			/S//S/		C					
			/S//S/	20	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C	SOME SAND PARTINGS AT 24'				
	25.0		/S//S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1018

Water Level NOT ENCOUNT. Date: 07/27/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
			/-//-/		C	CLAY, SILTY, DAMP TO MOIST, FIRM, BROWN				
			/-//-/		C					
			/-//-/		C					
	1.8		/-//-/		C					
			/-/0-/	2.5	C	CLAY, SILTY, SCATTERED GRAVEL, WET, VERY SOFT,				
			/-/0-/		C	BROWN, MOTTLED BLACK				
			/-/0-/		C					
			/-/0-/		C					
			/-/0-/		C					
			/-/0-/	5.0	C					
			/-/0-/		C					
	6.2		/-/0-/		C					
			/-//-/		C	CLAY, SILTY, WET, VERY SOFT, RED BROWN				
	7.1		/-//-/		C					
	7.6		/-*/-*	7.5	C	CLAY, SANDY, SILTY, VERY SOFT, BROWN, SOME DRK				
			//////		C	STREAKING ON BEDDING, FREE FLUID IN BEDDING				
			//////		C	CLAY, WET, SOFT, RED BROWN, SOME BLACK MOTTLING				
	9.1		//////		C					
	9.7		*/**/*		C	SAND, CLAYEY, MOIST TO WET, LOOSE, YELLOW BROWN				
			//////	10	C	CLAY, WET, FIRM, RED BROWN				
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////		C					
	15.2		//////	15	C					
			/*//*/		C	CLAY, SANDY, WATER BEARING, VERY SOFT, BROWN,				
	15.9		/*//*/		C	SAND LAMINATIONS(<0.5 CM)				
			/S//S/		C	CLAY, SHALEY, MOIST, HARD, RED TO PURPLE BROWN				
			/S//S/		C	SOME GREY CLAY MOTTLING, FISSLE AND FINE BLOCKY				
			/S//S/		C	(<1 CM)				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/	20	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C	GRADES SANDIER BELOW 22.1'				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	25.0		/S//S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1019

Water Level NOT ENCOUNT. Date: 07/27/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
			/-//-/		C	**CLAY**, SILTY, MOIST, FIRM TO STIFF, BROWN				
			/-//-/		C					
	1.5		/-//-/		C					
			/-//-/		C	**CLAY**, SILTY, WET, SOFT, BROWN				
			/-//-/	2.5	C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	5.0	C					
			/-//-/		C					
	6.0		/-//-/		C					
			/-//-/		C	**CLAY**, SILTY, WET, VERY SOFT, BROWN, SAND SEAMS				
	6.8		/-//-/		C	(~1 CM), WATER BEARING				
	7.2		/*/*/*	7.5	C	**CLAY, VERY SANDY, WET, VERY SOFT, GREY**				
			/-//-/		C	**CLAY**, SILTY, WET, SOFT TO FIRM, RED BROWN,				
			/-//-/		C	WEAK BLACK MOTTLING				
			/-//-/		C					
			/-//-/		C					
			/-//-/	10	C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
	12.0		/-//-/		C					
	12.5		*/*/*/		C	**SAND**, CLAYEY, WET, LOOSE, BROWN				
			/-//-/		C	**CLAY**, SILTY, WET, FIRM TO STIFF, BROWN				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	15	C					
			/-//-/		C					
	16.0		/-//-/		C					
			/S//S/		C	**CLAY**, SHALEY, MOIST, HARD TO VERY HARD, RED				
			/S//S/		C	BROWN, FISSLE AND FINE BLOCKY(<1 CM), SOME				
			/S//S/		C	GREY CLAY MOTTLING				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/	20	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	25.0		/S//S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1020

Water Level NOT ENCOUNT. Date: 07/27/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	LL	PI	CLASS.
			/-//-/		C	**CLAY**, SILTY, MOIST TO WET, SOFT, BROWN				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	2.5	C					
	3.0		/-//-/		C					
			/-//-/		C	**CLAY**, SILTY, WET, SOFT, BROWN				
			/-//-/		C	DARK SPOT AT 3.3'				
			/-//-/		C					
			/-//-/	5.0	C					
			/-//-/		C					
	6.0		/-//-/		C					
			//*/		C	**SAND**, CLAYEY, WET, LOOSE, BROWN				
	6.7		*/*/*/		C					
			//////	7.5	C	**CLAY**, WET, FIRM TO STIFF, BROWN				
			//////		C					
			//////		C					
			//////		C					
			//////		C					
			//////	10	C					
			//////		C					
			//////		C					
	11.8		//////		C					
			/*//*/		C	**CLAY**, SANDY, WET, SOFT, BROWN				
	12.4		/*//*/		C					
			//////		C	**CLAY**, WET, FIRM TO STIFF, BROWN				
	13.5		//////		C					
	13.9		/*//*/		C	**CLAY**, SANDY(FINE TO MEDIUM), WET, HARD, BROWN				
			/S//S/		C	**CLAY**, SHALEY, HARD, BROWN TO RED BROWN, THIN				
			/S//S/	15	C	LAMINATIONS, FISSLE AND FINE BLOCKY(<1 CM),				
			/S//S/		C	SOME GREY CLAY MOTTLING				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S*/S/		C	GRADES SANDIER				
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/	20	C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
			/S*/S/		C					
	25.0		/S*/S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1021

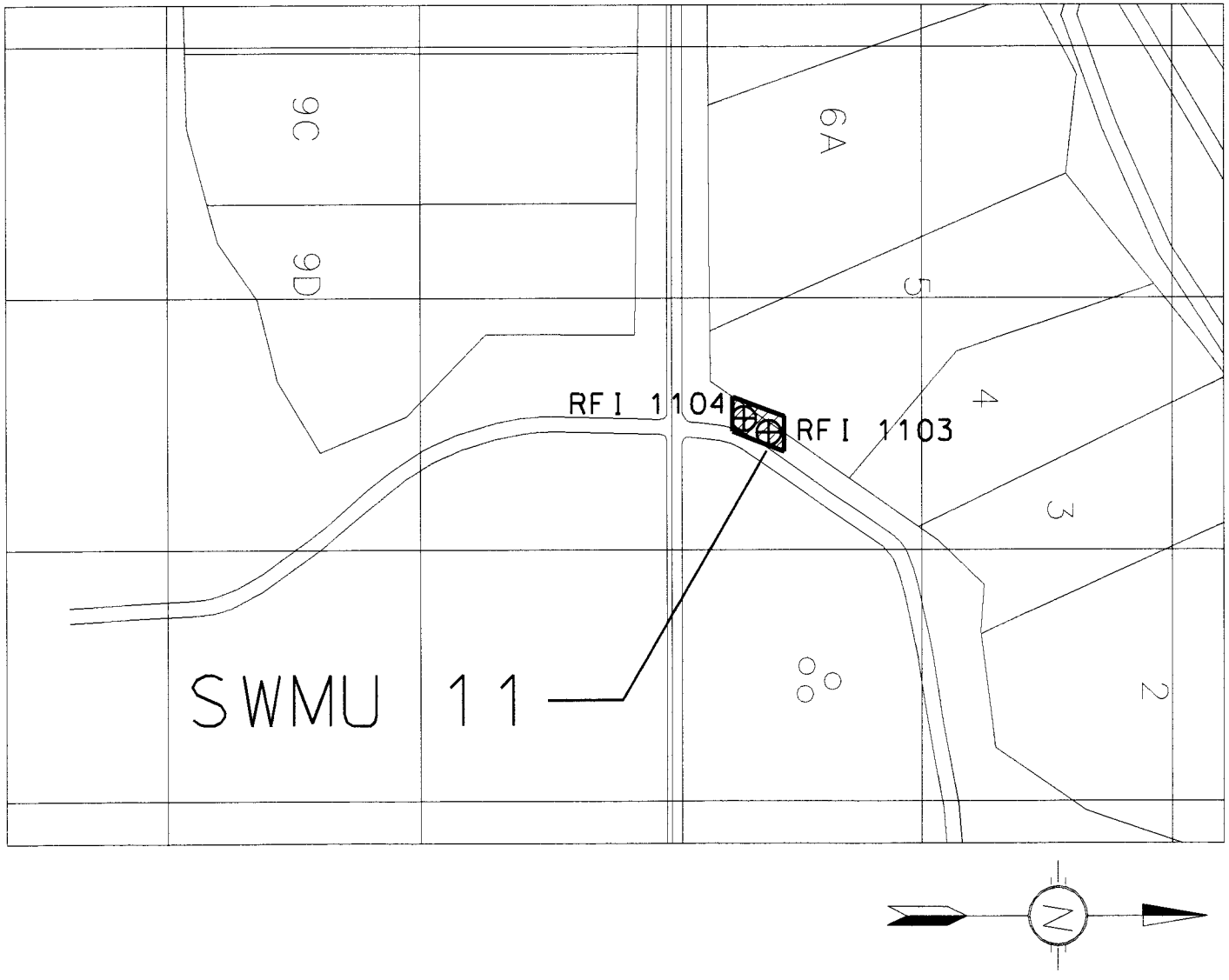
Water Level NOT ENCOUNT. Date: 07/27/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
			/-*/-/		C	**CLAY**, SILTY, SLIGHTLY SANDY, WET, FIRM, BROWN				
			/-*/-/		C					
	1.7		/-*/-/		C					
			/-//-/		C	**CLAY**, SILTY, WET, SOFT, BROWN, BLACK AT 1.8 TO				
	2.4		/-//-/	2.5	C	1.9'				
			/*//*/		C	**CLAY**, SANDY(APPEARS TO BE IN <0.5 CM STINGS),				
			/*//*/		C	SOFT TO VERY SOFT, BROWN				
			/*//*/		C					
			/*//*/		C					
	5.0		/*//*/	5.0	C					
			//////		C	**CLAY**, WET, SOFT, BROWN				
	6.1		//////		C					
			*/**/*		C	**SAND**, CLAYEY, WET(POSSIBLY WATER BEARING),				
	6.8		*/**/*		C	LOOSE, SHARP CONTACT				
			/-//-/	7.5	C	**CLAY**, SILTY, RARE SAND STRINGER(<0.5 CM), WET,				
			/-//-/		C	FIRM TO STIFF, RED BROWN				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/	10	C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C	SAND STRINGER ~ 1" AT 11' & 13'				
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
			/-//-/		C					
	13.9		/-//-/		C					
			/S//S/		C	**CLAY**, SHALEY, HARD, RED TO RED BROWN, FISSLE				
			/S//S/	15	C	AND BLOCKY(<1 CM), SOME GREY MOTTLING, GRADES				
			/S//S/		C	SANDIER				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/	20	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	25.0		/S//S/	25	C					
	TOTAL DEPTH									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

GIANT REFINING
CINIZA REFINERY
SWMU 11
SECONDARY OIL SKIMMER



SHEET 1 OF 2

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location CINIZA REFINERY

Elevation EXISTING

Boring Number: RFI 1103

Water Level NOT ENCOUNT. Date: 08/10/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
			/*//*/		C	**CLAY**, SANDY, DRY, VERY SOFT, BROWN				
			/*//*/		C					
	1.5		/*//*/		C					
			//*///		C	**CLAY**, SLIGHTLY SANDY WET, VERY SOFT, GREY BLACK				
			//*///	2.5	C					
			//*///		C					
			//*///		C					
			//*///		C					
			//*///		C					
			//*///	5.0	C					
			//*///		C					
			//*///		C					
			//*///		C					
			//*///		C					
	7.5		//*///	7.5	C					
			/*/*/*		C	**CLAY**, VERY SANDY, WET, STIFF, RED BROWN				
	8.5		/*/*/*		C					
			/S//S/		C	**CLAY**, SHALEY, HARD, WET, RED TO RED BROWN,				
			/S//S/		C	BLOCKY, SOME GREY CLAY STREAKING AND MOTTLING				
			/S//S/	10	C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	15.0		/S//S/	15	C					
	TOTAL DEPTH									
				20						
				25						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

SHEET 2 OF 2

PRECISION ENGINEERING, INC.

File No. 94-114

Boring Location

LOG OF TEST BORINGS

Location GIANT REFINERY

Elevation EXISTING

Boring Number: RFI 1104

Water Level NOT ENCOUNT. Date: 08/10/94

LAB #	DEPTH	BLOWS/N	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	LL	PI	CLASS.
			/*//*/		C	**CLAY**, SANDY, DRY, VERY SOFT, BROWN				
			/*//*/		C					
			/*//*/		C					
			//*///		C					
	2.5		//*///	2.5	C					
			//*///		C	**CLAY**, VERY SANDY, WET, VERY SOFT, BROWN				
			//*///		C					
			/*/*/*		C					
			//*///		C					
	5.0		//*///	5.0	C					
			//*///		C	**CLAY**, WET, SOFT, RED BROWN				
	5.7		//*///		C					
			//*///		C	**CLAY**, WET, VERY SOFT, GREY/BLACK				
	7.2		//*///		C					
			//*///	7.5	C	**CLAY**, SANDY, WET, SOFT, BLACK				
	7.9		//*///		C					
			/*/*/*		C	**SAND**, CLAYEY, WET, MODERATELY DENSE, BROWN,				
			/S//S/		C	SLIGHT GREY STREAKS TO 9.5',				
			/S//S/		C					
	9.8		/S//S/	10	C					
			/S//S/		C	**CLAY**, SILTY, VERY SLIGHTLY SANDY, WET, HARD,				
	10.7		/S//S/		C	RED BROWN				
			/S//S/		C	**CLAY**, SHALEY, WET, HARD, RED BROWN, BLOCKY,				
			/S//S/		C	GREY CLAY MOTTLING				
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
			/S//S/		C					
	15.0		/S//S/	15	C					
	TOTAL DEPTH									
				20						
				25						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 94 171

Bore Point: 37'N, 37'W OF SE POND CORNER

LOG OF TEST BORINGS

Site: WWT UPGRADE CINIZA REFINERY

Water Elev: 7'

Elevation: 6887

Boring No.: 1

Date: 12-16-94

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
27276	0.0-2.5	GRAB	//////		G	CLAY, WET, SOFT, RED-BROWN	19.7	33	17	CL/A-6
			//////		G					
			//////		G					
			//////							
27277	2.5-4.0	9-11-7	//**//	2.5	S	CLAY, SANDY IN STREAKS, SAND-WATER BEARING,	20.9			
			//**//		S	BROWN, WET, STIFF				
			//**//		S					
			//**//							
			//**//							
27278	5.0-6.5	5-5-6	//////	5.0	S	CLAY, WET, BROWN, FIRM	27.1	35	18	CL/A-6
			//////		S	1" SAND SEAM AT 5.8-5.9				
			//**//		S					
			//////							
			//////							
			//////	7.5						
			//////							
			//////							
			//////							
			//////							
27279	10.0-11.0	4-8-	//**//	10	S	CLAY/SANDY CLAY/SAND INTERBEDS,				
			//**//		S	SOFT, WET, BROWN				
			//**//		S					
	11.0-11.5	-29	------			POORLY INDURATED SHALE, CHINLE FORMATION				
			------			HARD, MOIST, LIGHT RED BROWN				
			------			CUTTINGS FLOW ON SURFACE AT 12'-WATER BEARING				
			------			ZONE				

27280	15.0-16.2	34-67-50(2)	---*/-	15	S	SHALE, CHINLE FORMATION, CLAYEY, SANDY,		35	13	CL/A-6
			---*/-		S	RED-BROWN, HARD, MOIST				
			---*/-		S	MOTTLED GREEN GREY ZONES OF REDUCTION				
			---*/-							
			---*/-							
			---*/-							
			---*/-							
			---*/-							
			---*/-							
			---*/-							
27281	20.0-20.9	34-52(4)	---*/-	20						
			---*/-							
	TD									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 94-171

Bore Point: 37'N, 37'E OF SW POND CORNER

LOG OF TEST BORINGS

Site: WWT UPGRADE
CINIZA REFINERY

Water Elev: 2.8'

Elevation: 6887

Boring No.: 2

Date: 12-16-94

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
27282	0.0-2.5	GRAB	//////		G	CLAY, WET, SOFT, RED-BROWN	18.3			
			//////		G					
			//////		G					
			//////							
27283	2.5-4.0	3-3-3	//**//	2.5	S	CLAY, SAND SEAMS, SAND-WATER BEARING,	16.6	24	8	SC/A-2-4
			//**//		S	WET, SOFT				
			//**//		S					
			//**//							
			//**//							
27284	5.0-6.5	4-5-5	//**//	5.0	S	CLAY, SAND SEAMS, SAND-WATER BEARING,	28.3			
			//**//		S	WET, SOFT				
			//**//		S					
			//**//							
			//**//							
			//**//	7.5						
			//**//							
			//**//							
			//**//							
			//**//							
27285	10.0-11.5	4-6-6	//**//	10	S	CLAY, SAND SEAMS, SAND-WATER BEARING,		30	16	CL/A-6
			//**//		S	WET, FIRM				
			//**//		S	SLIGHTLY MORE SANDY THAN ABOVE				
	13.0		------			SHALE, CHINLE FORMATION, RED-BROWN,				
			------			GREY MOTTLED, DAMP, HARD, FISSLE				

27286	15.0-16.5	14-25-42	------	15	S					
			------		S					
			------		S					

27287	20.0-21.5	21-40-45	------	20	S			43	17	CL/A-7-6
			------		S					
			------		S					
	TD									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

Sheet: 3 of 3

PRECISION ENGINEERING, INC.

File #: 94-171

Bore Point: 45'W, 50'S OF NE CORNER (INTERIOR)

LOG OF TEST BORINGS

Site: WWT UPGRADE CINIZA REFINERY

Water Elev: 2.2'

Elevation: 6887

Boring No.: 3

Date: 12-16-94

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
27288	0.0-2.5	GRAB	//**//		G	CLAY, SANDY, VERY WET, VERY SOFT, RED BROWN	17.3	26	12	SC/A-6
			//**//		G	WATER FLOWING IN HOLE AT 2.4'				
			//**//		G					
			//**//							
27289	2.5-4.0	3-3-4	***/**	2.5	S	SAND, FINE, LOOSE, BROWN, WATER BEARING	17.1	22	8	SC/A-4
			***/**		S	SOME CLAYEY STREAKS <1"				
			***/**		S					
			***/**							
			***/**							
	5.0-6.0	4-4-	***/**	5.0						
27290	6.0-6.5	-5	///*//		S	CLAY, SLIGHTLY SANDY, SOFT, WET, BROWN	28.6			
			///*//		S					
			///*//		S					
			///*//							
			///*//	7.5						
			///*//							
			///*//							
			///*//							
			///*//							
27291	10.0-11.5	4-5-6	//**//	10	S			31	16	CL/A-6
			//**//		S					
			//**//		S					
	13.0		------			SHALE, CHINLE FORMATION, RED-BROWN,				
			------			FISSLE, DAMP/MOIST, HARD				
			------			GREE/GREY LAMINATIONS AND MOTTLING				

27292	15.0-16.3	16-35-50(4)	------	15	S					
			------		S					
			------		S					
	TD									

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 95-126

Bore Point: See Boring Plan

LOG OF TEST BORINGS

Site: Diesel Tank
Gallup, NM

Water Elev: 30.0'

Elevation: Existing

Boring No.: one

Date: November 15, 1995

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
28651	0.0-2.5	GRAB	//*O//		G	**Clay**, some fine sand, some fine gravel, moist,	18.7	36	15	CL/A-6
			//*O//		G	soft, reddish brown				
			//*O//		G					
			//*O//							
			//*O//	2.5						
28652	2.5-4.0	5-6-8	//*O//		S	stiff, brown	19.5	30	10	
			//*O//		S					
			//*O//		S					
			//*O//							
			//*O//	5.0						
28653	5.0-6.5	4-5-6	//*O//		S	slightly sandy, wet, firm, brownish with some	25.8	42	15	CL/A-7-6
			//*O//		S	purple mixed in				
			//*O//		S					
			//*O//			gravel @ 7.0'-7.5'				
			//*O//	7.5						
28654	7.5-9.0	4-6-7	//*O//		S	stiff, reddish brown	21.4			
			//*O//		S					
			//*O//		S					
			//*O//							
			//*O//	10						
28655	10.0-11.5	5-7-7	--**--		S	**Silt**, fine, sandy, wet, stiff, reddish brown	22.0	--	--	ML/A-4
			--**--		S					
			--**--		S					
			--**--							
			--**--							
			--**--			gravel @ 13.0'-13.5'				
			--**--							
			--**--							
			--**--							
			--**--	15						
28656	15.0-16.5	5-8-9	**--**		S	**Sand**, silty, moist, medium dense, reddish	18.9			
			--		S	brown				
			--		S					
			--							
			--							
			--							
			--							
			--							
			--			gravel @ 19.0'-19.5'				
			--	20						
28657	20.0-21.0	3-11-	**--**		S	fine with some coarse, dense	18.6	--	--	SM/A-4
			--		S					
28658	21.0-21.5	20	OO**/O		S	**Gravel**, fine, sandy, some clay, damp, dense,	6.2			
			OO**/O			some whitish colored sand mixed with reddish				
			OO**/O			brown sand				
			OO**/O							

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: TM

PRECISION ENGINEERING, INC.

File #: 95-126

Bore Point: See Boring Plan

LOG OF TEST BORINGS

Site: Diesel Tank
Gallup, NM

Water Elev: 30.0'

Elevation: Existing

Boring No.: one cont.

Date: November 15, 1995

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
			00**/0							
			00**/0							
			00**/0							
			00**/0		25					
28659	25.0-26.0	4-6-	**/***			Sand, fine, some coarse, slightly silty,	19.6	--	--	SM/A-2-4
			/*			moist, moderately dense				
28660	26.0-26.5	6	//////			Clay, wet, stiff, reddish brown	22.7			
			//////							
			//////							
			//////							
			//////							
			//////							
			//////							
			//////		30					
28661	30.0-30.5	16-	**//0*			Sand, clayey, some fine gravel, water bearing,	--	--	--	SM/A-4
			**//0*			very dense, reddish brown				
28662	30.5-31.5	40-50	00**00			Gravel, fine, fine sand mixed with coarse,	--	--	--	GM/A-1-b
			00**00			white sandstone mixed in sample, some clay,				
	31.5		00**00			water bearing, very dense				
	TD									
						plugged bottom of hole with one bucket of				
						bentonite pellets and 2 bags of bentonite gel,				
						then hole filled with cuttings				

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: TM

LOG OF BORING NO. 1

Project: Sulferox Unit and Hydrotreater Unit — Job No. 3122JZ030

Elevation: Not Determined — Datum:

Type/Size Boring: 7" Auger — Rig Type: CME-55

Groundwater Conditions: Groundwater was encountered at 17 feet on 03/16/92 — Date: 03/16/92

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
							CONCRETE; 2.5 inches thick.
					DAMP	GC	FILL 2.5 feet. Clayey gravel; red.
		50/11"	R				
		33	S		DAMP	SM	SILTY SAND; red, moderate amount of gravel.
5							
		80/9"	R	121	5.8		
		37	S				
10							
					DAMP	SM	SILTY SAND; red, medium dense. Trace of small gravel.
		45	R	121	5.2		
		32	S				
15					DAMP	SM	SILTY SAND; red, medium dense. Some gravel.
		11	S		SAT.	SM	SILTY SAND; red, loose. Silty clay lenses. Hydrocarbon odor.
20							
		13	S				
25							
		50/3"	S		DAMP		SILTSTONE; red, soft.
30							

Stopped at 30 feet.

LOG OF BORING NO. 2

Project: Sulferox Unit and Hydrotreater Unit — Job No. 3132JZ030

Elevation: Not Determined — Datum:

Type/Size Boring: 7" Auger — Rig Type: CME-55

Groundwater Conditions: Groundwater was encountered at 17 feet on 03/16/92 — Date: 03/16/92

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
							CONCRETE; 2.5 inches thick.
					PL-LL	CL	SANDY CLAY; gray, soft.
					PL	CH	SILTY CLAY; red, stiff. Some sandy clay with trace of gravel at 9 feet.
		21	R	111	17.6		
5		20	S				
		34	R	116	13.2		
10		21	S				
					DAMP	SM	SILTY SAND; red, medium dense. Some gravel. Hydrocarbon odor. Thin clay lense at 23.5 feet.
		18	S				
15							
		18	S		SAT.		
20							
		33	S				
25							
					DAMP		SILTSTONE; red, soft.
		50/3"	S				
30							

Stopped at 30 feet.

LOG OF BORING NO. 1

Project: Cogeneration Facilities - Gas Turbine Generators — Job No: 3129J381

Elevation: 98.8 — Datum: B.M. Assumed Elev. 100.0 Base of Fire Hydrant

Type/Size Boring: 7" Auger — Rig Type: CME-55

Groundwater Conditions: Groundwater encountered at 15'3" on 08/23/89 — Date: 08/23/89

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					SL	GC	GRAVEL; dark red brown, asphalt pieces. Some clay. Trace of silt.
		9	G R	92	22.2 PL	CL	SILTY CLAY; dark red brown, some gravel, firm.
5		13	S		SL	CL	CLAY; dark red brown, some gravel, firm.
		25	R	119	SL 8.2	CL	SILTY CLAY; dark red brown, firm.
		20	S		SL	CL	SANDY CLAY; dark red brown, firm, some gravel.
10		30	S		PL	SM	SILTY SAND; tan, some gravel, medium dense.
15		50/3"	S		SAT.		▽
20		50/6"	S		SLT. MOIST SAT.		SANDSTONE; tan to gray, poorly sorted, fine to medium grained sand. Gravel present.
25					SAT.		SANDSTONE; more clay, gray, tan, fine grained sand.
30							Stopped at 25 feet.

LOG OF BORING NO. 2

Project Cogeneration Facilities - Gas Turbine Generators Job No. 3129J081

Elevation 99.1 Datum B.M. Assumed Elev. 100.0 Base of Fire Hydra

Type/Size Boring 7" Auger Rig Type CME-55

Groundwater Conditions Groundwater encountered at 16' on 08/23/89 Date 08/23/89

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
					SL	GC	GRAVEL; dark red brown, asphalt pieces. Some clay. Trace of silt.
5		8 12	R S	107	17.0 PL	CL	SILTY CLAY; dark red brown, some gravel. Firm. Les gravel at 5 feet.
10		14 20	R S	100	19.1 PL	CL	SANDY CLAY; dark red brown, firm. Some silt.
15		33	S		SL	GM	GRAVEL; dark red brown to tan, sand, some clay. Firm.
		41	S		SAT.	CL	SILTY CLAY; dark red brown, firm. Sand lenses.
20		50/3½"	S		MOIST MOIST		Weathered SANDSTONE; gray, very fine grained sand.
25					MOIST		SILTY CLAYSTONE; gray, weathered, fine grained sand.
30							Stopped at 25 feet.

LOG OF BORING NO. 3

Project: Cogeneration Facilities - Building Job No. 31294081

Elevation: 97.0 Datum: B.M. Assumed Elev. 100.0 [illegible] Fire Hydra[illegible]

Type/Size Boring: 7" Auger Rig Type: CME-55

Groundwater Conditions: No groundwater encountered on 08/23/89 Date: 08/23/89

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
			G		SL	CL	SILTY CLAY; dark red brown, firm.
5		28 29	R S	112	16.6	SM	SILTY SAND; light red to tan, some gravel. One inch gravel, medium dense.
10		29	S		SL	GM	GRAVEL; tan to red brown, sand; some silt.
		47	R	123	7.1		SANDSTONE; red to tan, coarse grained with gravel.
15		50/4" 50/5½"	S S		SLT. DAMP		SANDSTONE; gray, weathered, fine to medium grained sand.
20 25 30							Auger refusal at 19 feet. G = Grab 0-2'

Sheet: 1 of 2

PRECISION ENGINEERING, INC.

File #:01-072

Bore Point: see plan

LOG OF TEST BORINGS

Site:API Oil Separator
Giant Refining, Ninn...

Water Elev:Not Encountered

Elevation: Existing

Boring No.: One
01072-1

Date:5-15-01

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
39307	0.0-2.5	grab			G	**Clay**, reddish brown, wet, stiff	15.8			CL/A-6
					G					
					G					
				2.0	G					
					G					
39308	2.5-4.0	9-10-10			S	dark brown to black, silty, very stiff,	13.8			
					S	hydrocarbon odor W.D. 144.1 / D.D 126.6				
				4.0	S					
39309	5.0-6.5	5-6-9			S	dark brown, very stiff		39	22	CL/A-6
					S	hydrocarbon odor W.D. 132.0 / D.D 112.4	17.4			
				6.0	S					
39310	7.5-9.0	3-3-6			S	reddish brown, firm,				
				8.0	S	very thin sand seam @ 8.0'				
					S	hydrocarbon odor W.D. 133.0 / D.D. 106.7	24.7			
				10.						
					S	stiff W.D. 123.7 / D.D 101.6	21.8			
39311	10.0-11.5	4-7-8			S					
					S					
				12.						
				14.						
	14.0					Chinle Formation				
39312	15.0-16.5	22-36-47			S	**Shale**, sandy, reddish brown to light reddish	15.2	37	9	SM/A-4
				16.	S	brown, very dense				
					S	moist W.D. 143.7 / D.D 124.2				
				18.						
				20.						
39313	20.0-20.5	50 (6")				light reddish brown W.D. 137.0 / 125.6	9.1			
	T.D. 20.5									
				22.						

Size & Type of Boring:2 1/4" ID HSA

Logged By: JF

Sheet: 2 of 2

PRECISION ENGINEERING, INC.

File #:01-072

Bore Point: see plan

LOG OF TEST BORINGS

Site:API Oil Separator
Giant Refining, Ciniza

Water Elev:Not Encountered

Elevation: Existing

Boring No.: Two
01072-2

Date:5-15-01

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE,CONDITION,COLOR,GRAINSIZE,ETC.)	%M	L	PI	CLASS.
39314	7"-34"	Shelby		2.0	SHELB	**Clay**, reddish brown, wet, pushed 24" recovered 20", hole open to 34" W.D. 144.2 / D.D. 132.3	8.9	24	11	SC/A-2-6
				4.0						
39315	5.0-6.5	3-2-2		6.0	SSS	**Clay**, very silty, very sandy, dark brown, very wet, soft	17.9			CL/A-4
39316	7.5-9.0	1-1-1		8.0	SSS	water bearing?, very soft, reddish-brown	26.5	32	12	CL/A-6
				10.						
39317	10.0-11.5	3-3-4		12.	SSS	**Clay**, silty, reddish brown, wet, firm W.D. 135.2 / D.D. 113.8	18.8			CL/A-6
				14.						
	14.0					Chinle Formation				
39318	15.0-15.9	33-50 (4")		16.	S	**Shale**, sandy, reddish brown to light reddish brown, very dense, damp W.D. 138.6 / 122.0	13.6			
	T.D. 15.9			18.						
				20.						
				22.						

Size & Type of Boring:2 1/4" ID HSA

Logged By: JF

PRECISION ENGINEERING, INC.

File #:01 117

Bore Point: East Boring

LOG OF TEST BORINGS

Site: Giant Refining Cinix

Water Elev: 19.0'

Elevation: Existing

Boring No.: 01-117-B1

Date: August 30, 2001

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
	0.0-1.0	CONTINUOUS	//////		**CLAY**, MOIST, FIRM, RED BROWN				
40161	1.0-2.1	CONTINUOUS	-/*/-		**SILT**, CLAYEY, SLIGHTLY SANDY (VERY FINE), LOOSE	9.7			
	2.1-5.0	CONTINUOUS	//////		DAMP, ROOT MATTER ABUNDANT				
			//////		**CLAY**, VERY FIRM TO HARD, MOIST, RED BROWN				
			//////	5.0					
40162	5.0-5.2	CONTINUOUS	//////		**CLAY**, VERY FIRM TO HARD, MOIST, RED BROWN	15.1	49	31	CL/A-7-6
	5.0-6.5	11-18-31	//////						
			//////						
			//*///		VERY FINE SAND SEAM FROM 7.5' TO 7.7'				
			//////	10					
40163	10.0-11.5	12-21-23	//////		SLIGHTLY BLOCKY STRUCTURE THROUGHOUT	14.2	56	33	CH/A-7-6
	11.8		//////						
	11.8-12.5	CONTINUOUS	//**//		**CLAY**, SANDY VERY FINE, MOIST, VERY FIRM, RED BROWN				
	12.5-15.0	CONTINUOUS	//////		**CLAY**, VERY STIFF, DARK RED BROWN, MOIST- WET,				
			//////	15	CHARCOAL PRESENT, DIFFICULT TO BREAKUP IN HAND				
40164	15.0-16.5	7-11-17	//////			18.6			
			//////						
	18.5		//////						
	18.5-20.0	CONTINUOUS	//**//		**CLAY**, VERY SLIGHTLY SANDY, WET, SOFT, RED				
			//**//	20	BROWN				
40165	20.0-20.5	2-	//**//			24.0			
	20.5-21.4	3-	/***//		**CLAY**, VERY SANDY VERY FINE, WET, RED BROWN, SOFT				
	21.4-21.5	2	//////		**CLAY**, WET, FIRM, RED BROWN				
40166	22.5-24.5	CONTINUOUS	//**//		**CLAY**, SANDY VERY FINE, WET, SOFT- FIRM, RED-BROWN	24.8			
	24.5-25.0	CONTINUOUS	//////	25	**CLAY**, WET, FIRM, RED BROWN				
	26.2		//////						
40167	26.2-29.0	CONTINUOUS	------		**SILTSTONE**, THIN MUDSTONE PARTINGS, SLIGHTLY	7.7			
			------		SANDY, GREEN-GREY, DARK RED BROWN PARTINGS,				
	29.0		------		DAMP HARD, **CHINLE FORMATION**				
	Total Depth			30	WATER BEARING IN THE SILTSTONE FROM 26.2'-27.0				
					BACKFILL TO SURFACE WITH BENTONITE GEL				
					(300 LBS)				
				35					
				40					

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

PRECISION ENGINEERING, INC.

File #: 01-117

Bore Point: West Boring

LOG OF TEST BORINGS

Site: Giant Refining Cibi...

Water Elev: Not Encountered

Elevation: Existing

Boring No.: 01-0117-B2

Date: August 31,2001

LAB #	DEPTH	BLOW COUNT	PLOT	SCALE	SAMPLE	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	%M	L	PI	CLASS.
	0.0-2.0	CONTINUOUS	//--//			**CLAY**, SLIGHTLY SILTY, FIRM, WET, RED BROWN				
			//**//							
	2.0-2.6	CONTINUOUS	//////			**CLAY**, SANDY(VERY FINE), MOIST, SOFT, RED-BROWN				
40168	2.6-5.0	CONTINUOUS	//////			**CLAY**,HARD,MOIST-WET,RED BROWN,SOME ROOT MATTER	13.3	49	31	CL/A-7-6
			//////	5.0						
	5.0-7.0	SHELBY	//////			**CLAY** AS ABOVE, PUSHED 2' RECOVERED 1'-11"				
			//////							
	7.0-10.0	CONTINUOUS	//////			SOME SLICKENSIDED SURFACES> 7'				
			//////							
			//////	10						
40169	10.0-11.5	11-19-21	//--//			**CLAY**, VERY SLIGHTLY SANDY, MOIST TO WET, RED	12.4	46	27	CL/A-7-6
	11.5-12.2	CONTINUOUS	//////			BROWN, BRITTLE				
	12.2-13.0	CONTINUOUS	**//**			**SAND**, CLAYEY, DAMP, RED BROWN,MODERATELY DENSE				
	13.0-15.0	CONTINUOUS	//////			**CLAY**,VERY STIFF,DIFFICULT TO CRUMBLE,MOIST-WET,RED BROWN,				
			//////	15		SOME ROOT MATTER, SOME SLICKENSIDED SURFACES WHEN BROKEN				
40170	15.0-16.5	8-10-11	//////				17.3			
			//////							
	17.5-19.0	CONTINUOUS	//--**			INTERBEDDED, VERY FINE SAND, SILT, CLAY,				
			//////			**CLAY** APPROXIMATELY 50% OF THE TOTAL SAMPLE				
40171	19.0-20.0	CONTINUOUS	//////	20		WET TO MOIST, HARD TO FIRM, RED BROWN	16.8			
40172	20.0-21.5	8-10-27	//--//			**CLAY**, VERY SILTY, CRUMBLES EASILY, GREY BROWN	12.6			
			//--//							
	22.0		//////			MORE DENSE> 21.5				
40188	22.0-22.9	CONTINUOUS	------			**MUD STONE/ SILT STONE**, MOIST, HARD, RED BROWN,	10.4			
			------	25		GREEN REDUCTION SPOTS				

	22.9		------							
	Total Depth			30						
						BACKFILL TO SURFACE WITH BENTONITE GEL				
						(600 LBS)				
				35						
				40						

Size & Type of Boring: 4-1/4" ID Hollow Stemmed Auger

Logged By: WHK

Geoscience Consultants, Ltd.

WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SAN-1

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9/24/85 Completion Date 9/24/85

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation ____ Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth	Litho	recov	RUN	From	To	Sample#/Ft	Lith/Remarks
1120 0			1	0	5	850528: 1125/4.0' 15.4	0.0-4.0 (4.0) SOIL; gry rd (5R 4/2) cly & slt + organic matter, loose & dry
5							
10			2	5	10	1130/10.0' 10.5	4.0-9.0 (5.0) ~~SILT~~ CLAY; dk rd brn (10R 3/4)
			3	10	15	1135/15.0' 9.4	< 5% silt, plastic clay w/ minor rocks
15							9.0-23.0 (14.0) SANDY CLAY, gry rd (10R 4/2),
20			4	15	20	1142/20.0' 12.0	clay + 10-25% mg ws sd
25			5	20	25	1147/25.0' 4.0	23.0-26 (3.0) SAND Med rd brn (10R 4/6); f g SANDY ws qtz sd, loose, dry
30			6	25	30	1155/30'	26.0-32.0 CLAY, As above; 32.0-42.0 CLAY, As ABOVE
35			7	30	35	1203/32.5' 1204/35.0'	16.5 "clay balls" in cuttings @ 34'
40			8	35	40	1210/37.5' 1211/40.0'	5.8 4.3 42.0-59.0 Sandy CLAY, As Above
45			9	40	45	1224/42.5' 1225/45.0'	12.9 57.5 BGL x 6819 59.0-64.0 SAND; med rd brn (10R 4/6); mg
50			10	45	50	1235/47.5' 1236/50.0'	17.9 18.0 ws qtz sd; water sat, sharp up & lower contact
55			11			1248/52.5' 1249/55.0'	18.9 20.9 64.0-75.0 SANDY CLAY, As above, wht & green red spots
60			12			1259/60'	NA ~~Encl H2O in sand @ 60'~~
65			13			1312/65'	18.9 Sat Sand ~~Have H2O Sand @ 64' on clay~~
70			14			1318/65' 1328/70'	Sat cly @ 65 23.4 Sat Clay & 9.6
75			15			1347/75'	Sandy cly @ 75, H2O in cuttings 75': unsat cly & ch 14.2 unsat clay
1400 80			16			1400/80'	11.8
							75.0-78.0 SAND; med rd brn (10R 4/6); m-cg, ws qtz sd, wat sat; sharp upper lower contact w/cly
							78.0-80.0 (TD) clay; As Above, green red spots. dry
							NW Corner, LTA

Geoscience Consultants, Ltd.

WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SMX-2

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9-26-85 Completion Date

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation 6883 Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth | Litho | recov

RUN	From	To	Sample#/Ft	Lith/Remarks
				~ 81' N62E FROM MW-4
			850926	
1	0	5	1015/2.5 1016/5.0	0-2.5' soil light-brn sandy calcareous root'l, moist silty clay
2	5	10	1018/7.5 1019/10.0	
3	10	15	1023/12.5 1024/15.0	2.5'-9.0' clay red slightly moist very cohesive
4	15	20	1050/17.5 1051/20.0	9.0'-9.1 sand buff fine-med gr unconsolidated
5	20	25	1059/22.5 1100/25.0	dry 9.1'-~17.0' CLAY; red, slightly moist, plastic
6	25	30	1112/27.5 1113/30.0	~17.0'-~23.0' SAND (WET) fg-med gr
				23'-30' CLAY: red, slightly moist, plastic
				WATER LEVEL 15'-7" . 1150

Sand ~17' 17-23'

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WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SMY-3

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9-26-85 Completion Date ____

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation ____ Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth | Litho | Recov

RUN	From	To	Sample#/Ft	Lith/Remarks
			850926 1214/0.0	
1	0	5	1215/2.5 1216/5.0	0 - 4.5' SOIL; brn, clayey, sandy soil
2	5	10	1218/7.5 1219/10.0	4.5 - 28.0 RED CLAY; s dry to slightly moist, local reduction nodules
3	10	15	1221/12.5 1222/15.0	
4	15	20	17.5 20.0	28.0-30+ RED SILTY CLAY, as above but more dry
5	20	25	1234/22.5 1235/25.0	
6	25	30	27.5 30.0	

0
5
10
15
20
25
30

Geoscience Consultants, Ltd.

WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SMY-4

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9-26-85 Completion Date ____

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation ____ Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth | Litho | Recov

RUN	From	To	Sample#/Ft	Lith/Remarks
			850926	
1	0	5	1325/0.0 1326/2.5 1327/5.0	0-10 shale/clay red slightly swint cohesive
2	5	10	1330/7.5 1331/10.0	
3	10	15	1335/12.5 1336/15.0	10-15 sand encountered at 10' dry coarse-fine gr low recovery
4	15	20	1345/17.5 1346/20.0	water level 15'5"
5	20	25	1354/22.5 1355/25.0	18-20 clayey sand (saturated) brn, fn-med gr w/ abundant clay
6	25	30	1402/27.5 1403/30.0	W.L 26'-10 #850926 1410
				20-24 sand; brn, fn gr (saturated) w/ v. minor clay
				24-25 sandy clay; brn (saturated) w/ silt & fn sand
				25-27.5 sand; fn-med gr (saturated) v. minor clay
				27.5-27 sandy clay (moist) silt & fn sand
				29-30+ silty clay; (dry) reddish brn w/ greenish reduction nodules
				pH 7.4
				Conductance 4850

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WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SMX-5

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 9-24-85 Completion Date ____

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation ____ Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth | Litho | Recov

RUN	From	To	Sample#/Ft	Lith/Remarks
1	0	5	1444/0.0 1445/2.5 1446/5.0	0-0.5 sand; lt brn, fn-med gr w/ minor clay
2	5	10	1453/7.5 1454/10.0	0.5-20.0+ clay; reddish brn, slightly moist plastic clay w/ minor amounts of reduction nodules increasing w/ depth
3	10	15	1500/12.5 1601/15.0	
4	15	20	1610/17.5 1611/20.0	

0
5
10
15
20
25
30

Sampler labeled SMW-5 → ~~SMW-5~~ = SMX-6

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WELL LOGGING FORM

Page ____ of ____

Client GIANT REFINING COMPANY Well Number SMX-6

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T 15 N R 15 W State New Mexico

County McKinley Contractor Fox

Spud Date 10/1/85 Completion Date 10/1/85

Logs Run Lith from Cores Logged By J.C. Hunter

Elevation ____ Spud In (Fm.) Chinle

Remarks Drilled w/Hollow Stem Auger & Continuous Sampler. Collected samples @ 2.5 and 5.0' intervals for %H_2O. Comp. as SS monitor Well

Depth	Litho	recov	RUN	From	To	Sample#/Ft	Lith/Remarks
							Renumbered SMX-6; open borehole, not completed
						851001:	
0			1	0	5	1118/4.0	0-4.0' SOIL; gry rd (10R 4/2); clayey loam w/ roots
5			2	5	10	1114/10.0	4.0-12.5' CLAY; dk rd brn (10R 3/4); v soft & plastic; ≤ 5% silt
10			3	10	15	1120/15.0	
15			4	15	20	1124/20.0	12.5-20.0 SANDY CLAY; gry rd (5R 4/2); clay w/ 10-20% f-c sand; faint wavy discont lam bdd 0°-3°/core
20			5	20	25	1128/25.0	
25			6	25	30	1135/30.0	
30			7	30	35	1140/35.0	20-22.0 SAND; gry rd (10R 4/2) cg-fg, poor sort, qtz + lithic RF + K-spar + plag, subrnd
35			8	35	40	1148/40.0	
40			9	40	45	1159/45.0	22-33 SANDY CLAY; pale rd brn (10R 5/4); cly w/ 15-25% f-c sand; faint wavy to discont lam bdd 0°-2°/core
45			10	45	50	1255/50.0	
50			11	50	55	1306/55.0	
			12	55	60	1325/60.0	33-36 SAND; gry rd (10R 4/2) - pale rd brn (10R 5/4) fg-vfg; poor sort, subangular, subrnd; qtz + feldspars
			13	60	65	1345/65.0	
Ref Auger @ 68' 1495			14	65	66	1359/68.0	
							36-57 CLAY; dk rd brn (10R 3/4); ≤ 2% silt; no reduction spots
							57-66 SANDY CLAY; gry rd (5R 4/2) - dsky rd (5R 3/4), locally mod brn (2.5YR 4/4); 10-20% vFc sd
							66-68 SANDSTONE; pale olive (10Y 6/2) - lt grn

Geoscience Consultants, Ltd.

WELL LOGGING FORM

Page ____ of ____

Client Giant — Well Number SMX-7

___ ¼ ___ ¼ ___ ¼ ___ ¼ S ___ T ___ R ___ State ___

County ___ Contractor ___

Spud Date ___ Completion Date ___

Logs Run ___ Logged By ___

Elevation ___ Spud In (Fm.) ___

Remarks Samples labeled SMW-6; 80' W of SP-2

Depth	Litho	Recov	
			0-4.0 Soil; gry rd (10R 4/2), cly loam
			4.0-9.0 CLAY: dk rd brn (10R 3/4), plastic w/ ≤10% silt
			9.0-13.0 SAND: gry rd (5R 4/2); mg-fg, mod-poor sort, subang, Q ± F, Lv
			13.0-20.0 CLAY; dk rd brn (10R 3/4), plastic, 10-15% silt
			20.0-23.0 SAND: pale rd brn (10R 5/4); fg, subang, mod sort, Q, ± Lv, F
			23.0-26.0 CLAY: dk rd brn (10R 3/4), <5% silt
			26.0-27.0 SAND: pale rd brn (10R 5/4) - gry rd (5R 4/2), vfg-fg, mod sort, subang,
			27-28 CLAY, dk rd brn (10R 3/4)
			28-29 SAND; as above
			29-31 CLAY; as above, moist
			31-35 SAND: WET; pale rd brn (10R 5/4) fg-vfg mod sort, Q + F + Lv
			35-40 CLAY: dk rd brn (10R 3/4), ≤10% silt
			40-45 CLAY: as above, dry
			45-47 SAND:, pale rd brn (10R 5/4), vfg, dry
			47-49 PEBBLE CONGLOMERATE: H grn gry (5GY 6/1) in clay matrix, pale rd brn (10R 5/4); chert and ss pebbles ¼"-1½" in clay matrix, reduction spots
			49-60 CLAY; as above
			60-67 CLAYEY SILTSTONE: pale rd brn (10R 5/4)
			67-70 SILTY SANDSTONE: gry rd (10R 4/1) + mb

ASSAIGAI ANALYTICAL LABORATORIES

Giant 950

TO: GeoScience Consultants
500 Copper N.W. Suite 325
Albuquerque, NM 87102

DATE: 9 October 1985
1402

ANALYTE: % Moisture

SAMPLE ID	ANALYTICAL RESULTS
85-09-25 1415 SMW-3 4.0'	8.3
85-09-25 1320 SMW-2 52.5'	18.1
85-09-25 1426 SMW-3 15.0'	13.5
85-09-25 1321 SMW-1 55.0'	15.0
85-09-25 1458 SMW-3 37.5'	17.3
85-09-25 1445 SMW-3 27.5'	8.6
85-09-25 1438 SMW-3 25.0'	9.6
85-09-25 1446 SMW-3 30.0'	5.3
85-09-25 1459 SMW-3 40.0'	14.5
85-09-25 1311 SMW-3 50.0'	14.9
85-09-25 1452 SMW-3 32.5'	20.7
85-09-25 1453 SMW-3 35.0'	15.3
85-09-25 1056 SMW-2 10.0'	8.4
85-09-25 1235 SMW-2 37.5'	13.3
85-09-25 1236 SMW-2 40.0'	16.2
85-09-25 1420 SMW-3 10.0'	7.4
85-09-25 0927 SMW-1 37.5'	12.6
85-09-25 1050 SMW-2 4.0'	16.9
85-09-25 0928 SMW-1 40.0'	17.9
85-09-25 1141 SMW-2 32.5'	16.9
85-09-25 1126 SMW-2 30.0'	8.1
85-09-25 1310 SMW-2 47.5'	18.0
85-09-25 1142 SMW-2 35.0'	16.3
85-09-25 0913 SMW-1 27.5'	10.8
85-09-25 1432 SMW-3 20.0'	3.6
85-09-25 0920 SMW-1 35.0'	15.0
85-09-25 1114 SMW-2 25.0'	4.5
85-09-25 1254 SMW-2 42.5'	18.5
85-09-25 0914 SMW-1 30.0'	7.1
85-09-25 0919 SMW-1 32.5'	13.0
85-09-25 1255 SMW-2 45.0'	3.6
85-09-25 0959 SMW-1 52.5'	15.0
85-09-25 1102 SMW-2 15.0'	7.2
85-09-25 0859 SMW-1 20.0'	8.4
85-09-25 0847 SMW-1 10.0'	5.4
85-09-25 0906 SMX-1 25.0'	4.3
85-09-25 0936 SMW-1 42.5'	20.0
85-09-25 0937 SMW-1 45.0'	14.3
85-09-25 0951 SMW-1 50.0'	13.3
85-09-25 0840 SMW-1 4.0'	11.9

7300 Jefferson N.E. • Albuquerque, New Mexico 87109 • (505) 345-8964

TO: GeoScience Consultants
500 Copper N.W. Suite 325
Albuquerque, NM 87102

DATE: 9 October 1985
1402

ANALYTE: % Moisture

SAMPLE ID	ANALYTICAL RESULTS
85-09-25 0950 SMW-1 47.5'	5.8
85-09-25 0852 SMX-1 15.0'	11.0
85-09-25 1106 SMW-2 20.0'	7.0
85-09-25 1000 SMW-1 55.0'	20.0
85-09-26 1112 SMX-2 27.5'	24.1
85-09-26 1215 SMX-3 2.5'	5.6
85-09-26 1446 SMX-5 5.0'	15.5
85-09-26 1250 SMX-3 27.5'	14.8
85-09-26 1251 SMX-3 30.0'	11.5
85-09-26 1336 SMX-4 15.0'	2.7
85-09-26 1100 SMX-2 25.0'	21.4
85-09-26 1327 SMX-4 5.0'	20.5
85-09-26 1501 SMX-5 15.0'	17.8
85-09-26 1500 SMX-5 12.5'	13.0
85-09-26 1234 SMX-3 22.5'	14.2
85-09-26 1214 SMX-3 0.0	7.9
85-09-26 1445 SMX-5 2.5'	15.3
85-09-26 1216 SMX-3 5.0'	14.3
85-09-26 1403 SMX-4 30.0'	17.5
85-09-26 1444 SMX-5 0.0	6.8
85-09-26 1354 SMX-4 22.5'	20.8
85-09-26 1335 SMX-4 12.5'	4.2
85-09-26 1510 SMX-5 17.5'	16.8
85-09-26 1511 SMX-5 20.0'	16.3
85-09-26 1355 SMX-4 25.0'	11.0
85-09-26 1345 SMX-4 17.5'	20.8
85-09-26 1219 SMX-3 10.0'	14.7
85-09-25 1218 SMX-3 7.5'	14.8
85-09-26 1453 SMX-5 7.5'	15.4
85-09-26 1454 SMX-5 10.0'	19.4
85-09-26 1331 SMX-4 10.0'	16.2
85-09-26 1402 SMX-4 27.5'	20.8
85:09-26 1346 SMX-4 20.0'	24.4
85-09-26 1051 SMX-2 20.0'	17.5
85-09-26 1113 SMX-2 30.0'	18.4
85-09-26 1050 SMX-2 17.5'	18.1
85-09-26 1222 SMX-3 15.0'	17.3
85-09-26 1221 SMX-3 12.5'	16.0
85-09-26 1325 SMX-4 0.0'	26.8
85-09-26 1059 SMX-2 22.5'	23.1
85-09-26 1235 SMX-3 25.0'	13.8
85-09-26 1330 SMX-4 7.5'	20.7
85-09-26 1326 SMX-4 2.5'	18.6

TO: GeoScience Consultants

ANALYTE: % Moisture

SAMPLE ID	ANALYTICAL RESULTS
SMX-2 1015 2.5'	14.6
SMX-2 1018 7.5'	19.5
SMX-2 1019 10.0'	11.3
SMX-2 1023 12.5'	21.2
SMX-2 1024 15.0'	21.5
SMX-3 20'	15.6
SMX-3 17.5'	18.3

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA, SW 846, EMSL-Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

Jennifer V. Smith

Jennifer V. Smith, Ph.D.
Laboratory Director

ASSAIGAI ANALYTICAL LABORATORIES

TO: GeoScience Consultants
500 Copper N.W. Suite 325
Albuquerque, NM 87102

DATE: 9 October 1985
1463

ANALYTE: % Moisture

SAMPLE ID	ANALYTICAL RESULTS
SMW-6 85-10-04 1002 5'	11.5
SMW-6 85-10-04 1017 15'	15.3
SMW-6 85-10-04 1039 25'	17.6
SMW-6 85-10-04 1111 35'	16.5
SMW-6 85-10-04 1145 45'	13.9
SMW-2 1016 5'	17.7
SMW-1 85-09-27 1301 65'	19.5
SMW-3 85-09-27 0841 45'	14.5

REFERENCE: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", USEPA, SW 846, EMSL-Cincinnati, 1982.

An invoice for services is enclosed. Thank you for contacting Assaigai Laboratories.

Sincerely,

Jennifer V. Smith

Jennifer V. Smith, Ph.D.
Laboratory Director

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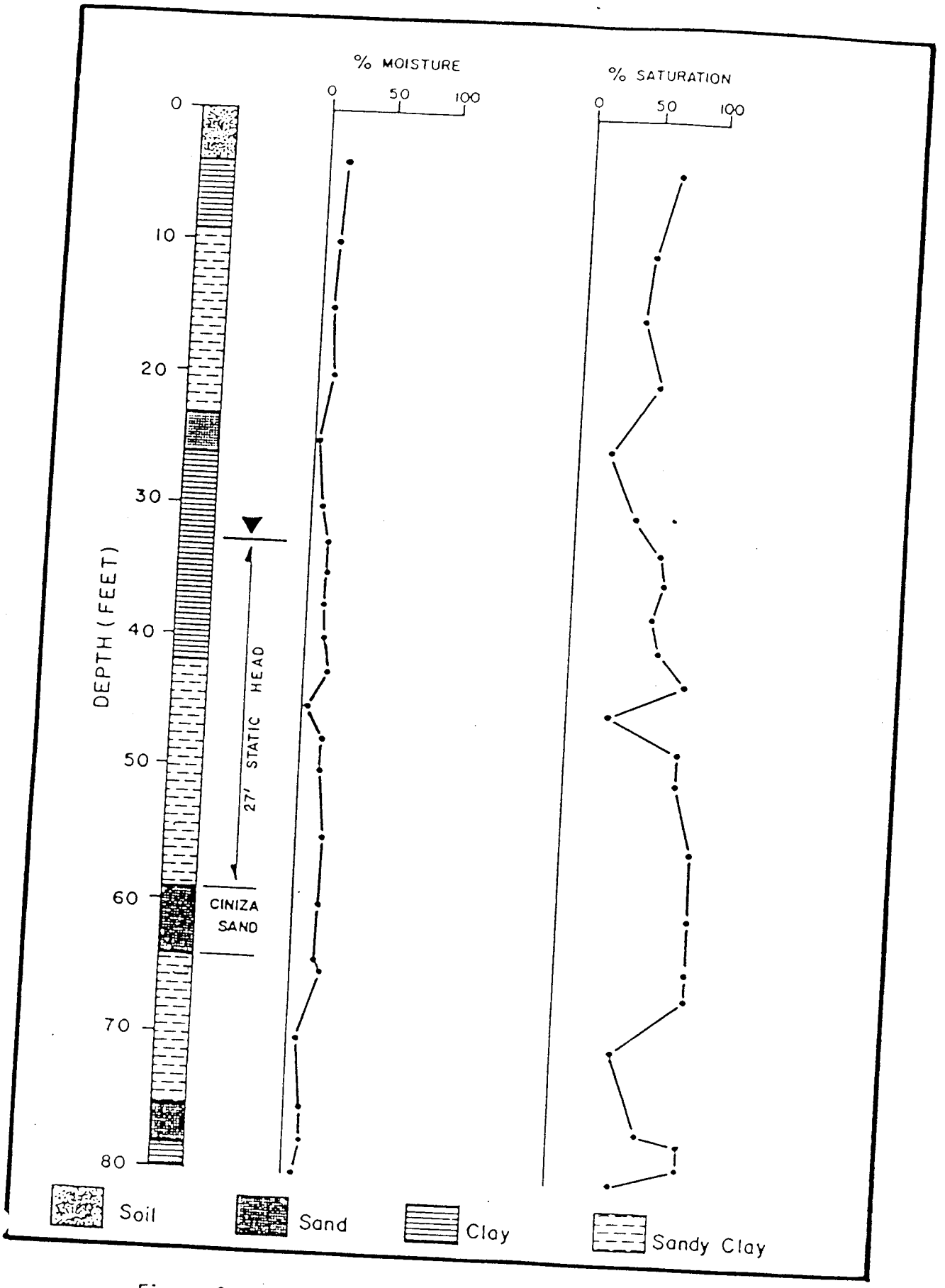

Figure 2-1 Soil Moisture Profiles From Borehole SMX-1